REPORT RESUMES

ED 002 771 24

STUDY OF SCREENING PROCEDURES FOR SPECIAL EDUCATION SERVICES TO MENTALLY RETARDED CHILDREN.

BY- TUBB, J. M. AND OTHERS
MISSISSIPPI STATE DEPT. OF EDUCATION, JACKSON
REPORT NUMBER CRP-139 PUB DATE JUN 60
CONTRACT OEC-6906
EDRS PRICE MF-$0.18 HC-$4.32 108P.

DESCRIPTORS- *MENTAL RETARDATION, *RETARDED CHILDREN, *SCREENING TESTS, *ELEMENTARY SCHOOLS, *PSYCHOMETRICS, EXCEPTIONAL CHILDREN, MISSISSIPPI, STANFORD BINET INTELLIGENCE TEST, JACKSON

THE MAJOR OBJECTIVE OF THE STUDY WAS TO FORMULATE A SOUND, EFFECTIVE AND WORKABLE METHOD OF SCREENING CHILDREN FOR PLACEMENT IN SPECIAL CLASSES FOR THE MENTALLY RETARDED. THE PROJECT WAS A PILOT STUDY OF APPROXIMATELY 5,000 ELEMENTARY SCHOOL CHILDREN IN GRADES 1 THROUGH 6 IN 2 REPRESENTATIVE COUNTIES. TEACHER AND PRINCIPAL REFERRALS WERE SECURED ON THIS SAMPLING, AND GROUP INTELLIGENCE AND GROUP ACHIEVEMENT TESTS HAVING THE LOWEST RATINGS WERE SELECTED FOR FURTHER INTENSIVE STUDY, INCLUDING INDIVIDUAL VERBAL AND PERFORMANCE PSYCHOMETRIC EXAMINATIONS, SOCIAL CASE HISTORIES, AND GENERAL AND SPECIAL MEDICAL EXAMINATIONS. ALL PERTINENT INFORMATION ON EACH PUPIL WAS IMPORTANT IN CONSIDERING HIM FOR PLACEMENT IN A SPECIAL CLASS. THE FIVE FACTORS USED IN THIS STUDY OR SIMILAR CRITERIA WERE APPLIED TO ALL OF THE PUPILS IN THE SCHOOL POPULATIONS SURVEYED. RESULTS OF THE STUDY IMPLIED THAT--(1) PUPILS IDENTIFIED BY ALL THE FACTORS MAY BE REGARDED AS ELIGIBLE FOR ADMISSION TO SPECIAL CLASSES UNTIL EVIDENCE TO THE CONTRARY IS SECURED, (2) PUPILS IDENTIFIED BY ONLY FOUR OF THE FIVE FACTORS MAY BE REGARDED AS HAVING A 90-PERCENT CHANCE OF BEING MENTALLY RETARDED, (3) PUPILS IDENTIFIED BY ONLY TWO OR THREE REFERRAL FACTORS SHOULD BE CONSIDERED DOUBTFUL PROSPECTS FOR CLASSES FOR THE MENTALLY RETARDED, (4) NO PUPIL SHOULD BE ADMITTED TO A CLASS FOR THE MENTALLY RETARDED UNTIL HE HAS BEEN ADMINISTERED AT LEAST ONE VALID INDIVIDUAL INTELLIGENCE TEST, (5) PROSPECTIVE PUPILS FOR A SPECIAL CLASS SHOULD HAVE AN HISTORICAL RECORD MADE OF PHYSICAL DEVELOPMENT BASED ON AN EXAMINATION BY A COMPETENT PEDIATRICIAN, AND (6) REPORTS OF PHYSICAL EXAMINATIONS AND TESTS OF SOCIAL MATURITY AND EMOTIONAL HEALTH CAN BE VERY HELPFUL IN TEACHING AND REMEDIAL WORK. (GC)

ED002771

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

STUDY OF SCREENING PROCEDURES FOR SPECIAL EDUCATION SERVICES TO MENTALLY RETARDED CHILDREN

Report
On Cooperative Research Project Number 139
Contract Number 6906
United States Office of Education
Conducted by the
Mississippi State Department of Education
Jackson, Mississippi

STATE DEPARTMENT OF EDUCATION

JACKSON, MISSISSIPPI

J. M. TUBB, Superintendent

S. A. BRASFIELD, Director
Division of Instruction

W. R. BURRIS, Supervisor
Program for Exceptional Children

The research reported herein was performed pursuant to a contract with the United States Office of Education, Department of Health, Education, and Welfare.

FOREWORD

Since 1952 the State of Mississippi has maintained a program for the education of exceptional children. This being a relatively new area of public education, it has been given very careful supervision and attention to assure its providing the best educational opportunities possible to those children for whom it was intended. The State Department of Education therefore welcomed the opportunity to cooperate with the United States Office of Education in conducting this study in an attempt to explore the problem of locating, diagnosing and screening children for classes for the mentally retarded.

It is not the purpose of this study to outline in detail a specific screening procedure but to establish some basic facts or principles on which a school system could build its own program of selecting pupils for special classes.

Although exceptional children are the primary beneficiaries of this project it is hoped that teachers, school administrators and other persons have profited from it and will find the results of the study helpful in developing screening programs to meet their own needs.

I am deeply appreciative of the work of each member of the research staff and all others who made contributions to the study.

June, 1960

J. M. Tubb
State Superintendent of Education

ACKNOWLEDGMENTS

This Research Project - STUDY OF SCREENING PROCEDURES FOR SPECIAL EDUCATION SERVICES TO MENTALLY RETARDED CHILDREN - was made possible by a grant from the U. S. Office of Education to the Mississippi State Department of Education. The study could not have been made without the cooperation and assistance of Commissioner L. G. Derthick and members of his staff who helped in the planning and development of the Project - Dr. Romaine P. Mackie, Dr. Harold Williams, Miss Alice Y. Scates, and others. These people were courteous, cooperative, and patient while extending to us the help that we needed.

It would be difficult to list all the persons, and the organizations they represented, who contributed to this study. It is the product of the cooperative efforts of a number of individuals, most of whom received no financial remuneration for their services.

Grateful appreciation is expressed to the three persons who were directly responsible for making the study and preparing the report:

W. R. Burris, Supervisor of Special Education, Mississippi State Department of Education - Director of the Study.

Dr. C. E. Elkema, Director of Research and Special Studies, Mississippi State Department of Education, who conducted most of the testing program, compiled the data, and prepared the first draft of the report - Assistant Project Director.

Dr. John E. Phay, Director of Educational Research, University of Mississippi - Consultant and Advisor for the Study.

Recognition is due the following staff members of the State Department of Education who participated in the Project:

Dr. S. A. Brasfield, Director of the Division of Instruction, who served as Coordinator of the Study.

W. T. Garner, Supervisor of Guidance and Testing Services - Consultant in Testing

Dr. Woodrow W. Clark, who made the study of screening practices used in other states.

Charles M. Evans, who conducted the first part of the testing program - group testing.

Miss Carolyn Lowther, who typed and mimeographed the Report.

Acknowledgment is made of the assistance given by the following groups of persons:

H. R. Sigler, Director of Special Education and Testing, Jackson Public Schools, Jackson, Mississippi

Dr. Floy J. Moore, Head of the Department of Psychiatry, University of Mississippi School of Medicine, Jackson, Mississippi

Miss Dorothy Day, Psychologist, Child Guidance Clinic, Mississippi State Board of Health, Jackson, Mississippi

Miss Mary Walker Mahon, Director of Child Welfare, State Department of Public Welfare, Jackson, Mississippi

Mr. William H. Kern, Coordinator of Special Education, Mississippi Southern College, Hattiesburg, Mississippi

The psychologists who assisted in the testing program:

Dr. Lillian Wolfe, University of Mississippi

Miss Laverne Driver, Jackson, Mississippi

The following specialists in testing service who assisted in the group testing phase of the study:

Miss Mildred Coleman, Gulfport, Mississippi

Miss Stella McCormick, Bay Springs, Mississippi

Mrs. Patricia Dunlap, Jackson, Mississippi

Miss Carolyn Thompson, Pascagoula, Mississippi

W. H. Williams, Oxford, Mississippi

Pediatricians who made the physical examinations and compiled the Physical Development Histories:

Dr. Shed H. Caffey, University of Tennessee

Dr. Max Dale Cooper, Tulane University

Dr. Mithat Coruh, Duke University

Dr. William T. Dobbins, University of Tennessee

Dr. Raymond L. Landreneau, Tulane University

Dr. John C. Lipsey, Tulane University

Dr. W. F. McDonnell, Jr., Gulfport, Mississippi

We should also like to express our appreciation to the school superintendents, principals, teachers, parents, and students who cooperated and assisted in a fine way in making possible the completion of this study.

TABLE OF CONTENTS

Chapter Page

I. INTRODUCTION.......... 1

II. PROCEDURES.......... 9
The Population.......... 9
Techniques for Obtaining the Data.......... 11
Treatment of the Data.......... 15

III. COMPARISON OF THE RESULTS OF THE APPLICATION OF REFERRAL FACTORS WITH FINDINGS OF THE PRIME FACTOR, THE STANFORD-BINET TEST.......... 16
Teacher Referral of Mentally Retarded Pupils.......... 16
Group Intelligence Test A Referrals.......... 16
Group Intelligence Test B Referrals.......... 19
Referrals by Group Achievement Test.......... 19
Referrals from Two Years or More Retardation by School Age-Grade Placement.......... 19
Method of Selection of Pupils to be Included in the Further Diagnostic Screening.......... 23
The Selection of the Prime Factor.......... 23
Referrals by the Various Criteria Compared with Stanford-Binet Test Results.......... 23
Results of the Application of Pairs of Referral Criteria Compared with the Findings of the Prime Factor, the Stanford-Binet Test.......... 38
Results of the Application of Combinations of Three Referral Factors Compared with the Findings of the Prime Factor, the Stanford-Binet Test.......... 41
Results of the Application of Combinations of Four Referral Factors Compared with the Findings of the Prime Factor, the Stanford-Binet Test.......... 43
Results of the Application of the Combination of all Five Referral Factors Compared with the Findings of the Prime Factor, the Stanford-Binet Test.......... 45
Draw-A-Man Referrals Compared to Findings of the Prime Factor, the Stanford-Binet Test.......... 45

IV. BEHAVIOR CHARACTERISTICS ASSOCIATED WITH MENTALLY RETARDED AND PSEUDO-MENTALLY RETARDED CHILDREN.......... 47
Final Clinical Screening.......... 48
Emotional Maladjustment.......... 48
Social Maturity.......... 49
Physical Examinations.......... 50
Physical Development History.......... 51
Statistical Treatment.......... 52
Test of Stability of the Five Final Clinical Screening Factors Measured by Their Respective Standard Deviations and Coefficients of Variation.......... 53
Simple Correlation Analysis Findings of Final Clinical Screening Scores.......... 55

TABLE OF CONTENTS (CONT.)

Chapter Page

IV. (Cont.) Simple Correlation Between Rosenzweig and Stanford-Binet Scores........ 56
Simple Correlation Between Doll and Stanford-Binet Scores.... 57
Simple Correlation Between Physical Examination and Stanford-Binet Scores........ 58
Simple Correlation Between Physical Development History and Stanford-Binet Scores........ 59
Simple Correlation Between the Rosenzweig Test and Each of the Other Three Independent Variables........ 60
Simple Correlation Between the Doll Test and Each of the Other Two Independent Variables........ 62
Simple Correlation Between Physical Examination and Physical Development History Scores........ 63
Multiple Regression Analysis Involving the Dependent Factor, the Stanford-Binet Scores, and the Four Independent Factors, the Rosenzweig, Doll, Physical Examination, and Physical Development History Scores........ 64
Incidence and Percentages of Physical Development Findings and Physical Disabilities of Mentally Retarded Children...... 69
Incidence and Percentages of Physical Development Findings and Physical Disabilities of Pseudo-Mentally Retarded Children........ 70

V. SUMMARY AND CONCLUSIONS........ 74

APPENDIX........ 79

BIBLIOGRAPHY........ 95

LIST OF TABLES

Table | Page
I. Factors Used to Identify Mentally Retarded Children in 53 States and Territories.................................. 7

II. Number of Pupils Enrolled by School Areas and by Grades... 10

III. Number of Pupils Enrolled and Number Referred by Teachers by Grade and Area as Being Mentally Retarded............. 17

IV. Number of Pupils Enrolled and Number Identified by Group Intelligence Test A by Grade and Area as Being Mentally Retarded.. 18

V. Number of Pupils Enrolled and Number Identified by Group Intelligence Test B by Grade and Area as Being Mentally Retarded.. 20

VI. Number of Pupils Enrolled and Number Identified by Group Achievement Test by Grade and Area as Being Mentally Retarded.. 21

VII. Number of Pupils Enrolled and Number Identified by Age-Grade Placement by Grade and Area as Being Two Years or More Retarded.. 22

VIII. Number of Pupils Enrolled by Grade and Area and the Number Scoring 75 I.Q. or Lower on the Stanford-Binet Test...... 24

IX. Number of Pupils by Grade and by Area Identified by Teacher Referral and One or More Other Criteria and Number in Each Group Who Scored 75 or Lower on the Stanford-Binet Test.. 25

X. Number of Pupils by Grade and by Area Identified by the Group Intelligence Test A and One or More Other Criteria and Number in Each Group Who Scored 75 or Lower on the Stanford-Binet Test.. 26

XI. Number of Pupils by Grade and by Area Identified by the Group Intelligence Test B and One or More Other Criteria and Number in Each Group Who Scored 75 or Lower on the Stanford-Binet Test.. 27

XII. Number of Pupils by Grade and by Area Identified by the Group Achievement Test and One or More Other Criteria and Number in Each Group Who Scored 75 or Lower on the Stanford-Binet Test.. 28

XIII. Number of Pupils by Grade and by Area Who Were Two or More Years Retarded According to Age-Grade Placement and Identified by One or More Other Criteria and Number in Each Group Who Scored 75 or Lower on the Stanford-Binet Test... 29

LIST OF TABLES (CONT.)

Table Page

XIV. Summary of Data on the Five Factors........................ 32

XV. Composite of Data on Individual Referral Factors.......... 37

XVI. Number and Percentage of Pupils Referred by Combinations of Two Factors Compared with the Findings of the Stanford-Binet Test.. 40

XVII. Number and Percentage of Pupils Referred by Combinations of Three Factors Compared with the Findings of the Stanford-Binet Test.. 42

XVIII. Number and Percentage of Pupils Referred by Combinations of Four Factors Compared with the Findings of the Stanford-Binet Test.. 44

XIX. Number and Percentage of Pupils Referred by All Five Factors Compared with the Findings of the Stanford-Binet Test.. 45

XX. Number of Pupils by Grade and Area Identified by the Teachers' Evaluations of Drawings Compared with Findings on the Stanford-Binet Test................................ 46

XXI. Stability of Five Final Clinical Screening Factors Measured by Their Respective Standard Deviations and Coefficients of Variability in Testing Mentally Retarded Children.. 54

XXII. Stability of Five Final Clinical Screening Factors Measured by Their Respective Standard Deviations and Coefficients of Variability in Testing Pseudo-Mentally Retarded Children... 55

XXIII. Simple Correlation Between the Rosenzweig and the Stanford-Binet Test Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test................................ 56

XXIV. Simple Correlation Between the Doll's Vineland Social Maturity Scale Test Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test................................ 57

XXV. Simple Correlation Between the Physical Examination Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test.... 58

LIST OF TABLES (CONT.)

Table | Page

XXVI. Simple Correlation Between the Physical Development History Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test.. 59

XXVII. Simple Correlation Between Rosenzweig Scores and Doll Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test.. 60

XXVIII. Simple Correlation Between Rosenzweig Scores and Physical Examination Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test.. 61

XXIX. Simple Correlation Between Rosenzweig Scores and Physical Development History Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test.. 61

XXX. Simple Correlation Between Doll Scores and Physical Test Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test.. 62

XXXI. Simple Correlation Between Doll and Physical Development History Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test.. 63

XXXII. Simple Correlation Between Physical Examination and Physical Development Scores by Grades and by Children Who Scored 75 I.Q. or Lower and Those Scoring Above 75 I.Q. on the Stanford-Binet Test.. 65

XXXIII. Summary of Regression Analysis with the Stanford-Binet Scores Being Dependent on the Rosenzweig, Doll, Physical Examination, and Physical Development History Scores by Grades and by Children Scoring 75 I.Q. or Lower and Others Above 75 I.Q.. 66

XXXIV. Incidence and Percentages of Physical Development Findings and Physical Disabilities of Mentally Retarded Children... 70

XXXV. Incidence and Percentages of Physical Development Findings and Physical Disabilities of Pseudo-Mentally Retarded Children.. 71

STUDY OF SCREENING PROCEDURES FOR SPECIAL EDUCATION SERVICES TO MENTALLY RETARDED CHILDREN

CHAPTER I

INTRODUCTION

According to Baker, approximately 2 per cent of all children should be enrolled in classes for the mentally retarded.[1] On the basis of this estimate, Mississippi would have had in the first six elementary grades of its public schools some 7,400 mentally retarded children in need of special education services in 1959.[2]

The subject of the values and advantages of special classes for exceptional children, with a strong emphasis upon mentally retarded pupils, had been considered for some time prior to 1952 and from many points of view throughout the State of Mississippi. Because of this interest the Mississippi State Legislature, in 1952, passed an enabling act and appropriated $200,000 for the support of a state-wide program for teaching educable "exceptional children."[3] The responsibility for administering the program was placed in the State Board of Education. In keeping with this obligation, the State Board of Education appointed an advisory committee to recommend the policies, procedures, and rules and regulations for the proper administration of the program for exceptional children. This advisory committee was composed of psychologists, speech therapists, public school administrators, special education teachers, guidance workers, physicians, college instructors in special education, representatives of special schools, representatives from volunteer organizations, and staff members of the State Department of Education. The committee met several times and made recommendations on administration, pupil screening, and special teacher certification. These recommendations were adopted by the State Board of Education. Thus Mississippi became one of the majority of the states in the Union providing a public supported school program for exceptional children.

---

[1] Baker, Harry J., *Introduction to Exceptional Children*. New York: The Macmillan Company, 1953, p. 261.

[2] Mississippi State Department of Education, *Statistical Data 1958-59*. Jackson: 1959, p.30.

[3] *Mississippi Code of 1942, Recompiled*. Chapter 283, Laws of 1952.

The plan adopted for the screening of exceptional children was to establish in each of the state's senior colleges and universities and in the cities of Jackson and Meridian, a screening team. Such teams were to include representatives of psychological, medical, educational and speech correction services. The responsibility of the team was to examine any child referred to it by a school and to decide his eligibility to attend special education classes.

During the operation of the program it was found that as far as the mentally retarded were concerned, only about 50 per cent of the pupils referred by the schools were judged by the team to be eligible for special education classes.

Questions were asked: Are there ways by which schools can determine more accurately than has been found which children are mentally retarded? Moreover, even with a relatively large percentage of school referrals, are there ways to ensure that no mentally retarded person will be missed? What were the major problems of children who appeared to be mentally retarded, but on individual testing were found to be of borderline or higher intelligence? What were their academic problems? What were their emotional and social problems? What part, if any, did physical defects play in the performance of these children?

In seeking an answer to these questions a limited pilot study was initiated by the Advisory Council Health Committee of the Children's Code Commission with the cooperation of the State Department of Education.[4] Those who made this study attempted to secure information on the children not accepted for special classes. Following this study the State Department of Education saw the need for an additional study to determine a method that provided a more efficient screening system for mentally retarded children.

Through the interest of the Division of Instruction of the State Department of Education in this problem of identifying the exceptional child and the apparent paucity of published data concerning it, the State Supervisor of Special Education was authorized to make inquiry of the United States Office of Education as to the need for and the advisability of doing research on screening mentally retarded children for special education classes. In its reply, the United States Office of Education stated that there appeared to be a lack of research in this phase of special education and expressed a willingness to entertain an application for such a study under the terms of Public Law 531. Accordingly, a proposal was submitted to the Assistant Commissioner of Research in the United States Office of Education. Following this, the U. S. Office of Education entered into a contract with the Mississippi State Board of Education for the study under the Cooperative Research Program, Federal Project No. 139.

The title of the research project is "Study of Screening Procedures for Special Education Services to Mentally Retarded Children."

---

[4] Mississippi Children's Code Commission, Study On Rejectees of Classes For Mentally Retarded Children. Jackson: 1956.

The problem was to find, discover, or devise the simplest and most practical method by which teachers and administrators could identify children in need of special education.

The method used was to explore the relationships between various easily administered measures in screening and the child's need for special education classes. This was to be done by:

(1) The application of (a) teachers' referrals, (b) group intelligence tests, (c) group achievement tests, and (d) age-grade placement to tentatively identify pupils who might qualify for special education classes.

(2) The administration of the Stanford-Binet Test to those pupils tentatively identified by (1) above. The Stanford-Binet Test was to be used as the "prime factor" for identification of the mentally retarded pupils in this study.

(3) The examination of all pupils tentatively identified as mentally retarded, (1) above, by tests of social maturity and emotional stability and physical examinations, including both physical fitness and physical development.

(4) The determination of the factor or combination of factors that appears to be most valid in identifying mentally retarded children.

The plan of the study included an attempt to answer specific questions which, in a sense, also provided limitations: Are mentally retarded children easily identified in the classroom? For example, are teachers good judges in the referral of pupils who they think are mentally retarded? Are group intelligence and achievement tests sufficient in identifying mental deviates? Is non-promotion of two years or more in the first six grades of the elementary school indicative of mental deviation? What implications do answers to questions such as these have for the identification of mental deviates in need of special class placement?

In this study the pupils who were identified by two or more of the criteria listed in (1) above were selected for further examination as explained in detail in Chapter II.

The instruments and techniques used in the final clinical screening in obtaining the data were formulated as the investigation expanded. The instruments, other than the Stanford-Binet Intelligence Test which was used as the prime factor, were the Rosenzweig Picture Frustration Test to locate emotional imbalance, the Doll Social Maturity Test, and a physical examination to determine both physical fitness and physical development. The procedures are discussed in Chapter II and also in connection with the finding.

The present status of screening of mentally retarded children in the public schools of the nation is shown by a questionnaire investigation made by the writer in October, 1958.

The questionnaire was sent out from the Mississippi State Department of Education to all Supervisors and/or Directors of Special Education in the various states and territories of the nation. A one hundred per cent return was obtained with the exception of one state. The questionnaire listed ten factors which are commonly used to identify mentally retarded children. The factors listed were as follows: (1) Teacher Referral, (2) I.Q. or Mental Maturity, (3) A.Q. or Achievement Quotient, (4) Academic Record, (5) Age-Grade Tables, (6) Attendance, (7) Social History, (8) Family History, (9) Physical Examination Reports, and (10) Physical Development History. The respondents also were asked to add any other factors which they used.

Table I, page 7, indicates the eight factors used by a large majority of the states and territories in identifying mentally retarded children in their public schools. The factors that are single starred in the table are factors used for identification purposes, and those double starred were those factors which were emphasized in screening mental deviates.

An examination of Table I reveals that of the fifty-three states and territories reporting special education programs, 48 used teacher referral as a factor and 15 emphasized its use; 51 used intelligence tests and 45 emphasized their use; 36 used achievement tests and 17 emphasized their use; 44 used academic records and 15 emphasized their use; 40 used social histories and 12 emphasized their use; 34 used family histories and 4 emphasized their use; 42 used physical examination reports and 16 emphasized their use; and 35 used physical development histories and 8 emphasized their use.

TABLE I

FACTORS USED TO IDENTIFY MENTALLY RETARDED CHILDREN IN 53 STATES AND TERRITORIES

State	Teacher Referral	I.Q. or Mental Maturity	A.Q. or Achievement Quotient	Academic Record	Social History	Family History	Physical Examination Reports	Physical Development History
Alabama	**	**	*	*	**	*	**	*
Arizona	*	*	*	*	*	*	*	*
Arkansas	*	**	*	**		*	**	*
California	*	**						
Colorado	**	**	*	**	*	*	*	*
Connecticut	**	**	*	*	*	*	**	*
Delaware	*	**	**	*	*	*	*	*
District of Columbia	**	**			**	*	**	**
Florida	*	*		*	*		*	
Georgia	*	*	*	*	*	*	*	*
Idaho	No state prescribed method							
Illinois	*	**	*		*	*		*
Indiana		**	**	*	**	*	*	*
Iowa	*	**	**	*		*	*	*
Kansas	**	**	**	**	**		*	*
Kentucky	*	**		*	*	*		*
Louisiana	*	**	**	**	*	*		
Maine	*	**		*	*	*	**	*
Maryland	*	**	**	*	**	*	**	**
Massachusetts	**	**		**	*	*	*	*
Michigan	*	*	*	*	*	*	*	*
Minnesota	*	**	*	*				
Mississippi	*	**	*	*	*	*		
Missouri	*	**	**				**	*
Montana	*	**	*	**		**	**	**
Nebraska	**	*	*	*	*	*	*	
Nevada	**	**	**	*	*	*	*	*
New Hampshire	**	**		*				
New Jersey	*	**	**	*	**	*	*	**
New Mexico	**	**	**	**	*		**	
New York	*	**	**	**	**	**	**	**

TABLE I (CONT.)

State	Teacher Referral	I.Q. or Mental Maturity	A.Q. or Achievement Quotient	Academic Record	Social History	Family History	Physical Examination Reports	Physical Development History
North Carolina	*	**		**			*	
North Dakota	*	**		*	*			
Ohio	*	**	*	*			*	*
Oklahoma	*	**	**	*	*		**	*
Oregon		*		*	*	*	*	*
Pennsylvania	*	**	**	**	**	*	*	*
Rhode Island	*	**		**	*	*	*	*
South Carolina	*	**		*	*	*	*	
South Dakota	**	**			*		**	**
Tennessee	*	**	**		**	*	**	*
Texas	*	**	*	*	*			*
Utah	*	**	**	**	**	**	**	**
Vermont		**	*	*				
Virginia	*	**		*	*	*	**	**
West Virginia	*	**	*		*		*	
Wisconsin	**	**	*	*	**	*	*	
Wyoming	**	**	*	**	*		*	
Alaska							**	
Canal Zone		**	**	*	*	**	*	*
Guam	**	**		**	**	*	*	*
Hawaii	**	**	**	**	*	*	*	*
Puerto Rico	*	**	*	*			*	

(Factors single starred are factors used - double starred those factors emphasized)

CHAPTER II

PROCEDURES

The Population

Selection

Selecting the school areas in which to conduct the investigation proved to be a challenging task. It was decided that six of the physiographic areas of the state should be represented in the study: (1) the North Central Hills area, (2) the Delta area, (3) the Jackson Prairie, (4) the Bluff Hills area, (5) the Piney Woods, and (6) the Coastal Meadows.[5] The reason for this decision was that the topography of the land and its particular location were considered influencing factors as far as the socio-economic level of the population was concerned. It was thought that the 4,824 white public school pupils, who eventually provided the data for the study, represented all sections of the state.

Other criteria used to determine the socio-economic levels of the school areas selected were: the various areas' index of tax-paying ability, personal income, average farm income, wages earned in industry and sales, and the amount of state sales tax paid in each selected area. Three of the school areas selected fell below the state average personal income level while the other three areas were above the state average in personal income.

It was further decided that each of the three main types of school district administrative units should be represented. This included the county unit district, the consolidated school district, and the municipal separate school district. Additional factors which influenced the choices of location were: (1) the willingness of school administrators to have the study conducted in their school areas, (2) the relative stability of the school population, (3) the absence of a class in special education, and (4) the freedom granted the research personnel within the school areas surveyed. Cooperation and wholehearted interest were exhibited by the administrators, teachers, and pupils during the study.

---

[5] McLemore, R. A., and McLemore, Nannie Pitts, The Mississippi Story. River Forest: Laidlaw Brothers, 1959, p. 17.

Description

The six school areas studied were composed of what might be considered typical Mississippi schools. There were five entire counties and one municipal separate school district in another county that was heavily populated. These are identified in the report as School Areas "A" through "F". In the entire area studied there were nine school districts of which four were county units, two consolidated school districts, and three municipal separate school districts. There was a total of twenty-three attendance centers, six of which were of elementary level and seventeen centers having both elementary and secondary grades. As illustrated by Table II, thirty-six grades, with six grades in each of the school areas, were chosen to participate in the study.

TABLE II

NUMBER OF PUPILS ENROLLED BY SCHOOL AREAS AND BY GRADES

School Areas	Grades						Totals
	1	2	3	4	5	6	
A	178	166	171	152	157	133	957
B	177	145	178	165	152	135	952
C	209	218	192	212	186	157	1174
D	174	155	162	171	169	143	974
E	36	60	60	50	49	52	307
F	63	83	62	72	109	71	460
Total	837	827	825	822	822	691	4824

Of the 4,824 pupils enrolled at the beginning of the study 2,424 were boys and 2,400 were girls. Withdrawals, transfers, and sickness reduced the original number slightly.

The environment of each of the elementary schools included in this study may be considered conventional. Practically all of the pupils were in comfortable classrooms with adequate heat, light, and ventilation. Pupil-teacher-principal relationships might be considered normal. There appeared to be no pressures or problems unusual to the average classroom.

Techniques for Obtaining the Data

The instruments used in this study and their administration are described below.

The factors listed previously were used in the preliminary screening in an attempt to locate mentally retarded children among the elementary public school pupils in the areas surveyed.

Teacher Referral

In order that the referrals would not be influenced by the other factors used, before applying them the teachers were asked to identify pupils who they thought were in need of special classes for the mentally retarded. To aid in identifying pupils in their classes who should be in special education classes, teachers were given the eight guides as shown in Appendix D, page 87. Each teacher was provided a referral form on which there were spaces for the names of all the pupils in her class with columns in which she was to check her opinion of each pupil. This made it necessary for each teacher to evaluate every pupil in her class and not just select a few from the group. A copy of this blank is included under Appendix E, page 88.

Group Intelligence Tests

Two group intelligence tests also were used as factors in identifying pupils possibly in need of special education classes. Two group intelligence tests were selected because of their purported differences in verbal factors, dependence upon timing, and the nature of testing items; however, both were designed to measure the ability to do school work. Also, the administration of two group intelligence tests might indicate to what extent dependence could be placed upon a single test. Group tests are cheaper and easier to give and thus are more economical to give than individual tests. All pupils in the six lower grades in the various school areas surveyed were given Group Intelligence Test A and Group Intelligence Test B (See Appendix F, page 89) in an attempt to locate children with an I.Q. of 75 or below. The I.Q. of 75 was selected rather than a lower or higher I.Q. because it was thought that 75 was low enough to exclude all persons not in need of special education classes and high enough to conservatively select all persons who might be in need of special education classes for the retarded. The group intelligence tests were administered and scored by professionally trained personnel approved by the State Department of Education. Tables IV and V in Chapter III reveal the number and percentage of children identified by each group intelligence test as having scores of 75 I.Q. or lower out of the total number tested in each grade and in each area surveyed. These findings are presented with recognition of the limitations accompanying the interpretation of group tests.

Group Achievement Test

A fourth factor used in identifying children possibly in need of special education classes was a group achievement test. An achievement test was used because a typical characteristic of a mentally handicapped child is his retardation in academic achievement.

Achievement tests may be divided into two types, power tests and speed tests. Since the primary interest of the study was in the mentally handicapped child's ability to do a task rather than the speed with which he might accomplish it, a power test was chosen to be used in measuring achievement.

The Group Achievement Test (see Appendix F, page 89), a power test, was selected to be administered to all the children in the study. Three batteries of the test were given: the lower primary to grades one and two, the upper primary to the third grade, and the elementary to grades four, five and six. Of the three areas, reading, arithmetic, and language comprising each battery, only the first two, reading and arithmetic, were given in this study due to the time element involved. These two were averaged to give a total score. The validity of the tests was not affected by this step according to the test publishers.[6] The publishers also furnished norms indicating the levels to which persons with 75 I.Q.'s should score. Pupils making this score or lower were identified as being academically retarded for the purpose of this study.[7]

Retardation of Two Years or More

A fifth factor used in identifying pupils possibly in need of special education classes was two years or more of retardation based on age-grade tables. This factor is subject to many limitations. Probably the most serious is that it reflects the promotion policies of the schools in which it is used. Obviously, the use of social promotion as such would make the use of this factor invalid in locating mentally retarded children. Also, this factor would not be valid for pupils during their first two years of school age.

The age-grade status of each pupil in the study was based on the permissive first grade entrance age of five years and eight months. By state statute a child in Mississippi may enter school at the beginning of a session if he reaches his sixth birthday on or before January 1 of the following calendar year.[8] Thus the lower age limits for grades one through six were five years and eight months, six years and eight months, seven years and eight months, and so on respectively. Late school entrance, prolonged periods of illness, or absence from school to work may contribute to the pupils' being overage in relation to their grades in school.

---

[6] Letter from Dr. William M. Shanner, Director, Professional Services, California Test Bureau, Los Angeles 28, California, December 31, 1958.

[7] Ibid.

Psychological Test

An individual psychological examination, the Stanford-Binet Intelligence Test, Form L, was chosen to be administered to each of the pupils identified by the preliminary screening procedures and selected for further study. This test was used as the criterion that determined whether or not the pupils identified were to be considered mentally retarded. Pupils whose I.Q. scores on this test were 75 or lower were classified as being mentally retarded for purposes of this study. It is assumed that pupils so classified can benefit from special education classes.

Emotional Test

The Rosenzweig Picture Frustration Study was administered individually to the pupils identified by the preliminary screening in an attempt to determine whether or not they were subject to unusual emotional stress. This particular test was chosen because it appeared to have the firmest norms of the various types of tests in this particular field of diagnostic evaluation.

Social Maturity Test

The Doll's Vineland Social Maturity Scale was used to determine the social maturity of the pupils identified in the preliminary screening. This test was administered to the mothers of the pupils involved; however, it was necessary in a few cases to interview the foster mothers, sisters, or aunts of the pupils.

---

[8] Mississippi Code 1942, Annotated, 1958 Cumulative Supplement, p. 165, sec. 6225-03.

Physical Examination

A complete physical examination was given each of the pupils identified in the preliminary screening. The examination form was prepared by the Mississippi State Board of Health, and the examinations were made by pediatricians. See Appendix G, page 90.

Physical Development History

In addition to the physical examination, the mother of each child identified by the preliminary screening was interviewed by the pediatricians to secure a record of parental and familial diseases, birth injuries, or other defects, as well as neuropathic traits. The Physical Development History Form used by the pediatricians in their interviews with the mothers was prepared by the Department of Pediatrics, University of Mississippi Medical School. See Appendix H, page 92.

Treatment of the Data

Cards were provided for recording all of the data secured on each child included in the study. The data from these cards were recorded, classified, and tabulated for analysis and study.

CHAPTER III

COMPARISON OF THE RESULTS OF THE APPLICATION OF REFERRAL FACTORS WITH FINDINGS OF THE PRIME FACTOR, THE STANFORD-BINET TEST

This chapter presents findings of the various referral factors, singly and in combinations, in identifying children who usually would be considered eligible for special classes for the mentally retarded. In this study the upper limit of eligibility was considered a Stanford-Binet I.Q. of 75.

Data were secured from 4,824 public school pupils enrolled in the first six grades in the six school areas surveyed. The five parts of the preliminary screening procedure and the results from each are discussed separately in the sections which follow.

Teacher Referral of Mentally Retarded Pupils

Before the teachers were asked to identify the pupils in their classes whom they thought to be mentally retarded and who would profit from special education classes, they were furnished a list giving eight characteristics of mentally retarded children. See Appendix D, page 87. The data on the teachers' referrals by grade and by school area follow in Table III.

Group Intelligence Test A Referrals

This test was selected as one of two group intelligence tests for referral purposes for two specific reasons. It has a separate test for each grade thus restricting the test factors to a smaller educational range. It also is considered to have a rather low verbal factor.[9] Table IV, which follows, shows the number of pupils administered the test (Identified as "Enrolled") and the number and percentage of pupils scoring I.Q.'s of 75 or lower on the test.

---

[9] Segel, David, The Fourth Mental Measurements Yearbook, Oscar K. Buros, Editor. Highland Park: The Gryphon Press, 1953, p. 302.

TABLE III

NUMBER OF PUPILS ENROLLED AND NUMBER REFERRED BY TEACHERS BY GRADE AND AREA AS BEING MENTALLY RETARDED

School Areas	GRADE												TOTAL		
	1		2		3		4		5		6				
	Enrolled	Teach. Ref.	Enrolled	Teach. Ref.	Enrolled	Teach. Ref.	Enrolled	Teach. Ref.	Enrolled	Teach. Ref.	Enrolled	Teach. Ref.	Enrolled	Teach. Ref.	Per Cent
A	178	13	166	11	171	20	152	17	157	30	133	14	957	105	11.0
B	177	6	145	5	178	4	165	22	152	8	135	6	952	51	5.4
C	209	16	218	17	192	25	212	18	186	1	157	8	1174	85	7.2
D	174	17	155	5	162	16	171	10	169	11	143	13	974	72	7.4
E	36	5	60	4	60	4	50	9	49	10	52	0	307	32	10.4
F	63	17	83	13	62	14	72	10	109	7	71	0	460	61	13.3
Total	837	74	827	55	825	83	822	86	822	67	691	41	4824	406	8.4
Per Cent	8.8		6.7		10.1		10.5		8.2		5.9		8.4		

In the first column under each grade is the number of pupils enrolled and included in the sample. In the second column is the number referred by the teacher as being mentally retarded.

TABLE IV

NUMBER OF PUPILS ENROLLED AND NUMBER IDENTIFIED BY GROUP INTELLIGENCE TEST A BY GRADE AND AREA AS BEING MENTALLY RETARDED

School Areas	GRADE												TOTAL		Per Cent
	1		2		3		4		5		6				
	Enrol-led	Test A	Enrol-led	Test A	Enrol-led	Test A	Enrol-led	Test A	Enrol-led	Test A	Enrol-led	Test A	Enrol-led	Test A	
A	161	6	148	12	145	17	139	21	130	17	121	9	844	82	9.7
B	133	6	126	2	153	13	144	22	133	20	134	19	823	82	10.0
C	170	8	174	5	150	14	166	12	167	12	136	7	963	58	6.0
D	144	8	133	10	152	8	153	19	164	9	142	16	888	70	7.9
E	36	0	57	0	49	0	48	6	47	2	51	2	288	10	3.5
F	62	1	72	1	55	4	63	7	95	6	58	0	405	19	4.7
Total	706	29	710	30	704	56	713	87	736	66	642	53	4211	321	7.6
Per Cent	4.1		4.2		8.0		12.2		9.0		8.3		7.6		

In the first column under each grade is the number of pupils that were administered the Group Intelligence Test A and in the second column is the number of children that scored an I.Q. of 75 or lower on it.

Group Intelligence Test B Referrals

This test was selected for its brevity, ease of administration and scoring, and inexpensiveness. It appears to have a somewhat higher verbal factor than Group Intelligence Test A discussed in the preceding section. Table V, following, presents by grades and school areas the number of children taking Test B and the number scoring I.Q.'s of 75 or lower on the test.

Referrals by Group Achievement Test

Table VI, following, shows by grade and school area the number of pupils administered the Group Achievement Test, the number of pupils referred by it, and the percentage the number of pupils referred is of the number of pupils administered the test.

Referrals from Two Years or More Retardation by School Age-Grade Placement

Table VII presents the number and percentage of pupils retarded two years or more in the six school areas surveyed. The percentage of children overage for their grades varied from 2.9 to 10.2, the average being 6.6 per cent. It might also be noted that in the first grade only 1.3 per cent of the pupils were found to be retarded two years or more. Since retardation in this study designates overage placement caused by grade retention, late school entrance or other factors, it is probable that the pupils identified in the first and second grades were primarily late starters to school.

TABLE V

NUMBER OF PUPILS ENROLLED AND NUMBER IDENTIFIED BY GROUP INTELLIGENCE TEST B BY GRADE AND AREA AS BEING MENTALLY RETARDED

School Areas	GRADE												TOTAL		Per Cent
	1		2		3		4		5		6				
	Enrol-led	Test B	Enrol-led	Test B	Enrol-led	Test B	Enrol-led	Test B	Enrol-led	Test B	Enrol-led	Test B	Enrol-led	Test B	
A	161	21	148	19	157	28	141	8	148	10	118	8	873	94	10.8
B	148	32	126	17	157	41	110	21	133	17	115	16	789	144	18.3
C	177	17	187	14	173	21	178	1	168	4	111	8	994	65	6.5
D	159	8	135	14	161	29	163	9	156	5	137	12	911	77	8.5
E	35	4	57	3	60	8	46	1	47	0	50	0	295	16	5.4
F	60	5	75	13	57	9	66	3	97	4	58	2	413	36	8.7
Total	740	87	728	80	765	136	704	43	749	40	589	46	4275	432	10.1
Per Cent	11.8		11.0		17.8		6.1		5.3		7.8		10.1		

In the first column under each grade is the number of pupils that were administered Group Intelligence Test B and in the second column is the number of children that scored an I.Q. of 75 or lower on it.

TABLE VI

NUMBER OF PUPILS ENROLLED AND NUMBER IDENTIFIED BY GROUP ACHIEVEMENT TEST BY GRADE AND AREA AS BEING MENTALLY RETARDED

School Areas	GRADE												TOTAL		Per Cent
	1		2		3		4		5		6				
	Enrolled	Group Ach.	Enrolled	Group Ach.	Enrolled	Group Ach.	Enrolled	Group Ach.	Enrolled	Group Ach.	Enrolled	Group Ach.	Enrolled	Group Ach.	
A	157	7	152	11	137	29	143	26	126	28	103	19	818	120	14.7
B	155	15	129	3	160	19	149	27	133	15	124	16	850	95	11.2
C	173	16	185	11	159	22	196	20	183	12	150	15	1046	96	9.2
D	115	8	137	12	146	21	166	21	157	15	125	23	846	100	11.8
E	35	2	58	1	60	3	49	4	49	2	51	3	302	15	5.0
F	67	3	71	6	57	6	68	7	100	8	68	5	431	35	8.1
Total	702	51	732	44	719	100	771	105	748	80	621	81	4293	461	10.7
Per Cent	7.3		6.0		13.9		13.6		10.7		13.0		10.7		

In the first column under each grade is the number of pupils that were administered the Group Achievement Test and in the second column is the number of children that scored below the norms for children with I.Q.'s of 75 or lower.

TABLE VII

NUMBER OF PUPILS ENROLLED AND NUMBER IDENTIFIED BY AGE-GRADE PLACEMENT BY GRADE AND AREA AS BEING TWO YEARS OR MORE RETARDED

School Areas	GRADE												TOTAL		Per Cent
	1		2		3		4		5		6				
	Enrolled	2 Yrs. Ret.	Enrolled	2 Yrs. Ret.	Enrolled	2 Yrs. Ret.	Enrolled	2 Yrs. Ret.	Enrolled	2 Yrs. Ret.	Enrolled	2 Yrs. Ret.	Enrolled	2 Yrs. Ret.	
A	178	7	166	12	171	18	152	24	157	24	133	13	957	98	10.2
B	177	3	145	5	178	14	165	21	152	21	135	28	952	92	9.7
C	209	0	218	2	192	6	212	12	186	8	157	17	1174	45	3.8
D	174	1	155	6	162	6	171	13	169	13	143	16	974	55	5.6
E	36	0	60	0	60	2	50	4	49	2	52	1	307	9	2.9
F	63	0	83	0	62	4	72	5	109	8	71	2	460	19	4.1
Total	837	11	827	25	825	50	822	79	822	76	691	77	4824	318	6.6
Per Cent	1.3		3.0		6.1		9.6		9.2		11.1		6.6		

In the first column under each grade is the number of pupils that were enrolled and included in the total number studied. In the second column is the number who were retarded two years or more according to age-grade placement.

Method of Selection of Pupils to be Included in the Further Diagnostic Screening

It was realized that the ideal procedure would have been to select for further evaluation every child who was identified by one or more of the measures in the first screening. It was impossible to include such a large number of pupils, however, due to limitations of time and personnel. Also, it did not seem reasonable that a mentally retarded child would escape identification on four of the five criteria applied. It was therefore decided by the advisory committee that pupils who were referred by two or more of the five criteria used would be selected for further testing and examination. In this manner 411 children were identified by two or more of the five criteria employed. Of these, 310 pupils (201 boys and 109 girls) were available for additional tests and examinations. The remaining 101 were unavailable for further testing due to moving, withdrawal from school and other causes of absence.

The Selection of the Prime Factor

The Revised Stanford-Binet Intelligence Test was selected as the prime factor in determining the effectiveness of each of the five criteria used in the first screening procedures to locate mentally retarded children. The Stanford-Binet Intelligence Test was selected as the prime factor because of its wide use and acceptance as a standard of mental measurement.

Referrals by the Various Criteria Compared With Stanford-Binet Test Results

Table VIII, which follows, indicates the number of pupils enrolled in each school area, by grade, and the number who scored 75 or below on the Stanford-Binet Test. It should be recalled that the Stanford-Binet Test was administered only to those pupils who had been identified by two or more of the screening factors, or 310 pupils.

Tables IX through XIII present comparisons between Stanford-Binet Test results and referrals by each factor where one or more other factors identified the same pupils.

TABLE VIII

NUMBER OF PUPILS ENROLLED BY GRADE AND AREA AND THE NUMBER SCORING 75 I.Q. OR LOWER ON THE STANFORD-BINET TEST

School Areas	GRADE												TOTAL		Per Cent of Enrollment
	1		2		3		4		5		6				
	Enrol-led	Stan. Binet	Enrol-led	Stan. Binet	Enrol-led	Stan. Binet	Enrol-led	Stan. Binet	Enrol-led	Stan. Binet	Enrol-led	Stan. Binet	Enrol-led	Stan. Binet	
A	178	6	166	7	171	9	152	8	157	11	133	6	957	47	4.9
B	177	4	145	4	178	8	165	14	152	9	135	10	952	49	5.1
C	209	4	218	0	192	5	212	3	186	2	157	3	1174	17	1.5
D	174	2	155	3	162	7	171	5	169	10	143	10	974	37	3.8
E	36	0	60	0	60	0	50	4	49	1	52	0	307	5	1.6
F	63	0	83	1	62	3	72	2	109	4	71	0	460	10	2.2
Total	837	16	827	15	825	32	822	36	822	37	691	29	4824	165	3.42
Per Cent	1.9		1.8		3.9		4.4		4.5		4.2		3.42		

TABLE IX

NUMBER OF PUPILS BY GRADE AND BY AREA IDENTIFIED BY TEACHER REFERRAL AND ONE OR MORE OTHER CRITERIA AND NUMBER IN EACH GROUP WHO SCORED 75 OR LOWER ON THE STANFORD-BINET TEST

School Areas	GRADE												TOTAL		Per Cent Agreement with Stanford-Binet
	1		2		3		4		5		6				
	Teach. Ref.	Stan. Binet	Teach. Ref.	Stan. Binet	Teach. Ref.	Stan. Binet	Teach. Ref.	Stan. Binet	Teach. Ref.	Stan. Binet	Teach. Ref.	Stan. Binet	Teach. Ref.	Stan. Binet	
A	8	4	5	4	9	6	7	5	12	7	6	4	47	30	64
B	6	2	4	2	4	2	11	7	4	4	8	4	37	21	57
C	11	4	0	0	9	5	5	2	3	2	3	1	31	14	45
D	7	2	4	3	12	7	4	4	10	9	9	7	44	32	73
E	2	0	0	0	3	0	2	1	1	1	0	0	8	2	25
F	3	0	3	1	6	3	5	2	7	4	0	0	26	10	38
Total	37	12	16	10	43	23	34	21	37	27	26	16	193	109	56.5

The table should read as follows: Of 8 pupils in grade one of School Area A who were identified by Teacher Referral and one or more other criteria, 4 pupils scored 75 or lower on the Stanford-Binet Test.

TABLE X

NUMBER OF PUPILS BY GRADE AND BY AREA IDENTIFIED BY THE GROUP INTELLIGENCE TEST A AND ONE OR MORE OTHER CRITERIA AND NUMBER IN EACH GROUP WHO SCORED 75 OR LOWER ON THE STANFORD-BINET TEST

School Areas	GRADE												TOTAL		Per Cent Agreement with Stanford-Binet
	1		2		3		4		5		6				
	Test A	Stan. Binet	Test A	Stan. Binet	Test A	Stan. Binet	Test A	Stan. Binet	Test A	Stan. Binet	Test A	Stan. Binet	Test A	Stan. Binet	
A	5	5	4	4	5	2	11	8	10	7	6	4	41	30	73
B	4	3	2	2	8	7	15	12	12	9	8	7	49	40	82
C	5	1	0	0	5	2	3	2	5	2	4	3	22	10	45
D	4	2	1	0	4	2	9	5	9	9	10	8	37	26	70
E	0	0	0	0	0	0	4	4	1	1	0	0	5	5	100
F	1	0	1	1	3	3	7	2	7	4	0	0	19	10	53
Total	19	11	8	7	25	16	49	33	44	32	28	22	173	121	70.0

The table should read as follows: Of 5 pupils in grade one of School Area A who were identified by the Group Intelligence Test A and one or more other criteria, 5 pupils scored 75 or lower on the Stanford-Binet Test.

TABLE II

NUMBER OF PUPILS BY GRADE AND BY AREA IDENTIFIED BY THE GROUP INTELLIGENCE TEST B AND ONE OR MORE OTHER CRITERIA AND NUMBER IN EACH GROUP WHO SCORED 75 OR LOWER ON THE STANFORD-BINET TEST

School Areas	GRADE												TOTAL		Per Cent Agreement with Stanford-Binet
	1		2		3		4		5		6				
	Test B	Stan. Binet	Test B	Stan. Binet	Test B	Stan. Binet	Test B	Stan. Binet	Test B	Stan. Binet	Test B	Stan. Binet	Test B	Stan. Binet	
A	10	6	7	6	13	5	3	2	6	3	4	3	43	25	58
B	10	2	3	2	11	8	10	8	10	8	9	5	53	33	62
C	10	2	1	0	12	5	2	2	2	0	4	3	31	12	39
D	3	1	1	1	13	7	2	0	4	4	9	9	32	22	69
E	1	0	0	0	3	0	2	2	0	0	0	0	6	2	33
F	2	0	1	0	3	2	2	0	0	0	0	0	8	2	25
Total	36	11	13	9	55	27	21	14	22	15	26	20	173	96	55.5

The table should read as follows: Of 10 pupils in grade one of School Area A who were identified by the Group Intelligence Test B and one or more other criteria, 6 pupils scored 75 or lower on the Stanford-Binet Test.

TABLE XII

NUMBER OF PUPILS BY GRADE AND BY AREA IDENTIFIED BY THE GROUP ACHIEVEMENT TEST AND ONE OR MORE OTHER CRITERIA AND NUMBER IN EACH GROUP WHO SCORED 75 OR LOWER ON THE STANFORD-BINET TEST

School Areas	GRADE														Per Cent Agreement with Stanford-Binet
	1		2		3		4		5		6		TOTAL		
	Grp. Ach.	Stan. Binet	Grp. Ach.	Stan. Binet	Grp. Ach.	Stan. Binet	Grp. Ach.	Stan. Binet	Grp. Ach.	Stan. Binet	Grp. Ach.	Stan. Binet	Grp. Ach.	Stan. Binet	
A	2	2	4	4	16	9	10	7	15	8	8	6	55	36	65
B	6	2	2	2	10	5	15	12	10	8	14	9	57	38	67
C	9	3	1	0	9	5	6	3	4	2	5	3	34	16	47
D	6	2	5	3	13	7	7	5	9	9	11	9	51	35	69
E	1	0	0	0	1	0	5	4	0	0	0	0	7	4	57
F	1	0	3	1	5	3	6	2	5	4	0	0	20	10	50
Total	25	9	15	10	54	29	49	33	43	31	38	27	224	139	62.1

The table should read as follows: Of 2 pupils in grade one of School Area A who were identified by the Group Achievement Test and one or more other criteria, 2 pupils scored 75 or lower on the Stanford-Binet Test.

TABLE XIII

NUMBER OF PUPILS BY GRADE AND BY AREA WHO WERE TWO OR MORE YEARS RETARDED ACCORDING TO AGE-GRADE PLACEMENT AND IDENTIFIED BY ONE OR MORE OTHER CRITERIA AND NUMBER IN EACH GROUP WHO SCORED 75 OR LOWER ON THE STANFORD-BINET TEST

School Areas	GRADE												TOTAL		Per Cent
	1		2		3		4		5		6				
	2 Yrs. Ret.	Stan. Binet	2 Yrs. Ret.	Stan. Binet	2 Yrs. Ret.	Stan. Binet	2 Yrs. Ret.	Stan. Binet	2 Yrs. Ret.	Stan. Binet	2 Yrs. Ret.	Stan. Binet	2 Yrs. Ret.	Stan. Binet	Agreement With Stanford-Binet
A	2	2	4	4	10	8	9	6	16	8	7	4	48	32	67
B	3	3	3	2	8	4	12	8	10	9	17	9	53	35	66
C	0	0	0	0	3	2	4	3	4	2	2	3	13	10	77
D	1	1	0	0	4	1	6	3	9	8	12	9	32	22	69
E	0	0	0	0	1	0	3	3	1	1	0	0	5	4	80
F	0	0	0	0	3	2	5	2	5	4	0	0	13	8	61
Total	6	6	7	6	29	17	39	25	45	32	38	25	164	111	67.7

The table should read as follows: Of 2 pupils in grade one of School Area A who were two or more years retarded according to age-grade placement and identified by one or more other criteria, 2 pupils scored 75 or lower on the Stanford-Binet Test.

Tables XIV and XV present summaries of data on referrals by each specific factor and one or more other factors. Several interesting observations might be made of data on referral of pupils. It should be noted that the total number of 4,824 children was used in two items, Teacher Referral and Two Years or More Retarded by Age-Grade Placement, while several hundred fewer comprised the total number on each of the other three items. Because of school absence 613 pupils were not administered Group Intelligence Test A, 549 Group Intelligence Test B, and 531 the Group Achievement Test. Although this gave a larger total sample for Teacher Referral and Two Years or More Retarded by Age-Grade Placement, they ranked third and fifth respectively in the total number and per cent of single criterion referrals. The largest number of referrals was made by the Group Achievement Test with 461. This was to be expected due to the relatively large number of low-achievers in school.

When two or more criteria are used in referring pupils, the picture is somewhat different. The Group Achievement Test, in combination with one or more of the other four criteria, referred the largest number of pupils, with 224, and the greatest per cent of the total number, with 5.2 per cent; however, this number is only 48.6 per cent of the number referred by the Group Achievement Test alone. Although referrals by each criterion and one or more other criteria were very close in the percentage of the total number (3.4 to 4.1), there was a great deal of variation as to their percentages of the single criterion referrals, ranging from 40.3 per cent to 53.9 per cent. It was found from these data that the total number of children scoring an I.Q. of 75 or lower on the Revised Stanford-Binet Test was 165 (110 boys and 55 girls) or 3.42 per cent of the total number of 4,824 in the original group. There were 101 additional pupils referred by two or more of the criteria used who because of transiency, illness or other causes of absence were not administered the Stanford-Binet Test. Assuming that the same proportion of these 101 children would have also scored 75 or lower I.Q. as in the 310 from which 165 made such scores, there would have been 54 more children or a total of 219 so identified. This would have been 4.54 per cent of the total number of 4,824 pupils in the study classified as having Binet I.Q.'s of 75 or lower. Attention might be called to the similarity of the percentages of the total number for each test to this figure (Table XV, Col. 6).

The facts contained in that part of Table XV, columns 8 through 12, pertaining to pupils scoring 75 I.Q. or lower on the Binet test probably also have some significance. Of the 193 pupils referred by the teacher and one or more other criteria, 109 or 56.5 per cent scored 75 I.Q. or lower on the Revised Stanford-Binet Test. Of the 165 pupils scoring 75 I.Q. or lower on the Binet test, 56 or 33.9 per cent were missed or not identified by the teachers. Of the 173 pupils referred by Group Intelligence Test A and one or more other criteria, 121 or 70 per cent scored 75 or lower on the Binet test. Of the 165 pupils in the total study scoring 75 or lower on the Stanford-Binet Test, 11 had not taken the Group Intelligence Test A. Therefore, 33 or 21.4 per cent of the remaining 154 were not identified. Similar statements may be made for the other tests. From the above data it is apparent that no one test used in this study is adequate for identifying mentally retarded pupils.

TABLE XIV

SUMMARY OF DATA ON THE FIVE FACTORS

TEACHER REFERRAL

Items of Data	From Table	Grade						Total
		1	2	3	4	5	6	
1. Number in Study	III	837	827	825	822	822	691	4,824
2. Referred by teacher as being mentally retarded	III	74	55	83	86	67	41	406
3. Referred by teacher and one or more other factors	IX	37	16	43	34	37	26	193
4. Number in (3) scoring I.Q. 75 or lower on the Stanford-Binet Test	IX	12	10	23	21	27	16	109
5. Number in (3) scoring above I.Q. 75 on Stanford-Binet Test	Line (4) from Line (3)	25	6	20	13	10	10	84
6. Number scoring 75 or lower I.Q. on Stanford-Binet referred by two or more other factors but not identified by Teacher Referral (Number missed by Teacher Referral)		4	5	9	15	10	13	56

TABLE XIV (CONT.)

GROUP INTELLIGENCE TEST A

Items of Data	From Table	Grade						Total
		1	2	3	4	5	6	
1. Total number taking test	IV	706	710	704	713	736	642	4,211
2. Scored I.Q. 75 or lower	IV	29	30	56	87	66	53	321
3. Identified by Group Intelligence Test A and one or more other factors	X	19	8	25	49	44	28	173
4. Number in (3) scoring I.Q. 75 or lower on Stanford-Binet Test	X	11	7	16	33	32	22	121
5. Number in (3) scoring above I.Q. 75 on Stanford-Binet Test	Line (4) from Line (3)	8	1	9	16	12	6	52
6. Number scoring 75 or lower I.Q. on Stanford-Binet referred by two or more other factors but not identified by Group Intelligence Test A (Number missed by Group Intelligence Test A)		3	6	12	3	4	5	33

TABLE XIV (CONT.)

GROUP INTELLIGENCE TEST B

Items of Data	From Table	Grade 1	2	3	4	5	6	Total
1. Number taking test	V	740	728	765	704	749	589	4,275
2. Scored I.Q. 75 or lower	V	87	80	136	43	40	46	432
3. Identified by Group Intelligence Test B and one or more other factors	XI	36	13	55	21	22	26	173
4. Number in (3) scoring I.Q. 75 or lower on Stanford-Binet Test	XI	11	9	27	14	15	20	96
5. Number in (3) scoring above I.Q. 75 on Stanford-Binet Test	Line (4) from Line (3)	25	4	28	7	7	6	77
6. Number scoring 75 or lower I.Q. on Stanford-Binet referred by two or more other factors but not identified by Group Intelligence Test B (Number missed by Group Intelligence Test B)		2	4	5	18	12	5	46

TABLE XIV (CONT.)

GROUP ACHIEVEMENT TEST

Items of Data	From Table	Grade						Total
		1	2	3	4	5	6	
1. Number taking Group Achievement Test	VI	702	732	719	771	748	621	4,293
2. Scored below critical point	VI	51	44	100	105	80	81	461
3. Identified by Group Achievement Test and one or more other factors	XII	25	15	54	49	43	38	224
4. Number in (3) scoring I.Q. 75 or lower on Stanford-Binet Test	XII	9	10	29	33	31	27	139
5. Number in (3) scoring above I.Q. 75 on Stanford-Binet Test	Line (4) from Line (3)	16	5	25	16	12	11	85
6. Number scoring 75 or lower I.Q. on Stanford-Binet Test referred by two or more other factors but not identified by Group Achievement Test (Number missed by Group Achievement Test)		4	4	2	3	3	1	17

TABLE XIV (CONT.)

TWO OR MORE YEARS RETARDED

Items of Data	From Table	Grade						Total
		1	2	3	4	5	6	
1. Number in Study	VII	837	827	825	822	822	691	4,824
2. Two or more years retarded according to age-grade placement	VII	11	25	50	79	76	77	318
3. Two or more years retarded and identified by one or more other factors	XIII	6	7	29	39	45	38	164
4. Number in (3) scoring I.Q. 75 or lower on Stanford-Binet Test	XIII	6	6	17	25	32	25	111
5. Number in (3) scoring above I.Q. 75 on Stanford-Binet Test	Line (4) from Line (3)	0	1	12	14	13	13	53
6. Number scoring 75 or lower I.Q. on Stanford-Binet Test referred by two or more other factors but not two or more years retarded (Number missed by Two or More Years Retarded)		10	9	15	11	5	4	54

TABLE XV

COMPOSITE OF DATA ON INDIVIDUAL REFERRAL FACTORS

(1) Test	(2) Total Number	Referred by Single Test		Referred by Specific Test and One or More Other Tests			Referrals from Col. (5) Scoring I.Q.'s of 75 or Lower on the Binet Test		Number Found to Score I.Q.'s of 75 or Lower on the Stanford-Binet Test					
					Per Cent Col. (5) is				Did Not Take Specific Test	Not. Ident. by Specific Test and One or More Other Tests		Erroneously Identified		
		(3) Number	(4) Per Cent	(5) Number	Of Col. (2) (6)	Of Col. (3) (7)	(8) Number	(9) Per Cent	(10)	(11) Number	(12) Per Cent	(13) Number	(14) Per Cent	(15) Sum of Cols. (8),(10)&(11)
Teacher Referral	4,824	406	8.4	193	4.0	47.5	109	56.5	--	56	33.9	297	73.2	165
Group Intell. Test A	4,211	321	7.6	173	4.1	53.9	121	70.0	11	33	21.4	189	61.0	165
Group Intell. Test B	4,275	432	10.1	173	4.0	40.3	96	55.5	23	46	32.4	313	76.5	165
Group Achiev. Test	4,293	461	10.7	224	5.2	48.6	139	62.1	9	17	10.9	313	69.2	165
Two Yrs. or More Retarded	4,824	318	6.6	164	3.4	51.6	111	67.7	--	54	32.7	207	65.1	165

Results of the Application of Pairs of Referral Criteria Compared with the Findings of the Prime Factor, the Stanford-Binet Test

In securing effectiveness percentagewise of the use of two combined preliminary screening factors in an attempt to locate mentally retarded children, the following procedures were used. Teacher referrals were combined with each of the other four preliminary screening factors and then compared with the findings of the prime factor, the Stanford-Binet Test, given the same pupils. In like manner, Group Intelligence Test A referrals were combined with each of the remaining three factors and tested against the findings of the Stanford-Binet results. Group Intelligence Test B referrals were combined with each of the other two remaining screening factors and tested against the findings of the Stanford-Binet Test. The same procedure was carried out with the combining of each of the two remaining preliminary screening factors, the Group Achievement Test and Two Years or More Retardation, and comparing their findings with the results obtained from the Stanford-Binet Test using the same pupils.

The ten combinations of two preliminary screening factor referrals when contrasted with the findings of the prime factor, the Stanford-Binet Intelligence Test, gave an average percentage agreement of only 53.2 per cent in correctly locating mentally retarded children. This finding may appear to the reader to be a paradox since each of the five preliminary screening factors when compared to the findings of the Stanford-Binet Test had a correlation of from 55.5 per cent in the case of the Group Intelligence Test B, and a high of 70.0 per cent with the Group Intelligence Test A in locating mentally retarded children. It must be understood that many times when the various combinations were put together one or the other of the combinations had made an incorrect referral, thus making the combined choices incorrect when contrasted with the findings of the Stanford-Binet Test.

The application of pairs of referral criteria was the basis on which the entire refined sample of 310 pupils administered the Revised Stanford-Binet Test was selected. Any pupil referred by two of the five factors was selected for further study. By using two factors, 411 pupils were referred. Of the 310 available for further study, 165 or 53.2 per cent scored I.Q.'s of 75 or lower on the Revised Stanford-Binet Test. This is the percentage of totals only and does not hold true for each pair of factors. From Table XVI, which follows, can be seen the variations in the percentages of accuracy of specific pairs of factors and the percentage of the total number scoring I.Q.'s of 75 or lower on the Binet test identified by each pair. It can be noted from Table XVI that the pair of referral factors, Group Intelligence Test A and the Group Achievement Test, referred 59.4 per cent of the total number of pupils scoring I.Q.'s of 75 or lower on the Binet test, while the combination of Teacher Referral and Two Years or More Retardation according to age-grade placement had a low of 38.8 per cent of the total number scoring 75 or lower on the Binet test. It should be emphasized that no two of the five referral factors here used could be considered very reliable in identifying mentally retarded children. However, if all the pupils referred by two or more factors are used as the initial number of possible retardates for further screening and refining it might safely be assumed that there would be few, if any, retarded children missed and also a fair size working sample would be available.

Table XVI, following on the next page, should read as follows: Of 7 pupils referred by teachers and Group Intelligence Test A (2 factors only), 3 scored Binet I.Q.'s of 75 or lower (Col. 2), and 4 scored I.Q.'s above 75 (Col. 3). Of the 27 pupils referred by teachers and Group Intelligence Test A, identified by three factors only, 18 scored Binet I.Q.'s of 75 or lower (Col. 4), and 9 scored I.Q.'s above 75 (Col. 5).

TABLE XVI

NUMBER AND PERCENTAGE OF PUPILS REFERRED BY COMBINATIONS OF TWO FACTORS COMPARED WITH THE FINDINGS OF THE STANFORD-BINET TEST

Referral Factors	Ident. by 2 Factors		Ident. by 3 Factors		Ident. by 4 Factors		Ident. by 5 Factors		Total Referred			Per Cent Col. (10) is of Col. (12)	Per Cent Col. (10) is of Total (165) IQ 75 and Lower
	SB IQ 75 or Lower	Above 75 IQ.	SB IQ 75 or Lower	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ	Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Teacher Referral & Group Intelligence Test A	3	4	18	9	30	8	24	0	75	21	96	78.1	45.5
Teacher Referral & Group Intelligence Test B	1	21	16	10	13	4	24	0	54	35	89	60.7	32.7
Teacher Referral & Group Achievement Test	8	18	27	20	32	8	24	0	91	46	137	66.4	55.2
Teacher Referral & Two Years or More Retarded	0	6	13	9	27	7	24	0	64	22	86	74.4	38.8
Group Intelligence Test A & Group Intelligence Test B	1	2	16	11	27	9	24	0	68	22	90	75.6	41.2
Group Intelligence Test A & Group Achievement Test	3	6	25	12	46	13	24	0	98	31	129	76.0	59.4
Group Intelligence Test A & Two Years or More Retarded	1	6	21	10	41	12	24	0	87	28	115	75.7	52.7
Group Intelligence Test B & Group Achievement Test	4	16	20	16	29	9	24	0	77	41	118	65.3	46.7
Group Intelligence Test B & Two Years or More Retarded	2	3	18	13	24	8	24	0	68	24	92	73.9	41.2
Group Achievement Test & Two Years or More Retarded	2	6	20	16	43	12	24	0	89	34	123	30.5	53.9

Results of the Application of Combinations of Three Referral Factors Compared with the Findings of the Prime Factor, the Stanford-Binet Test

The application of combinations of three referral factors was made in the same manner as pairs of referral factors. Each factor was used in combination with every other pair of the five factors, giving ten combinations of three factors each.

Of the total of 310 pupils referred and administered the Stanford-Binet Test, 197 were referred by combinations of three or more factors. Of these 197 pupils referred, 140 or 71.1 per cent scored I.Q.'s of 75 or lower on the Stanford-Binet Test. The accuracy of the application of combinations of three referral factors is much higher than the 53.2 per cent accuracy of the application of pairs of referral factors. Twenty-five pupils or 15.2 per cent of those scoring I.Q.'s of 75 or lower on the Binet test and referred by pairs of factors were not referred by combinations of three or more factors. The accuracy of the various combinations of three factors is somewhat higher than that of pairs of factors, ranging from 78.4 per cent on the combination, Group Intelligence Test A, Group Intelligence Test B, and Group Achievement Test, to 91.7 per cent for the combination, Group Intelligence Test B, Teacher Referral, and Two Years or More Retardation by Age-Grade Placement.

Although the percentage of pupils referred who were found to score I.Q.'s of 75 or lower on the Binet test is greater for combinations of three referral factors, the number and per cent of the total number of pupils so

---

(Table XVII, which is on the next page, should read as follows: Of the 12 pupils referred by Group Intelligence Test A, Group Achievement Test, and Two Years or More Retarded, identified by three factors only, 9 scored Binet I.Q.'s of 75 or lower (Col. 2) and 3 scored I.Q.'s above 75 (Col. 3).)

TABLE XVII
NUMBER AND PERCENTAGE OF PUPILS REFERRED BY COMBINATIONS OF THREE FACTORS COMPARED WITH THE FINDINGS OF THE STANFORD-BINET TEST

Referral Factors	Ident. by 3 Factors		Ident. by 4 Factors		Ident. by 5 Factors		Total Referred			Per Cent Col. (8) is of Col. (10)	Per Cent Col. (8) is of Total (165) IQ 75 and Lower
	SB IQ 75 or Lower	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ	Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Group Intelligence Test A, Group Achievement Test, & Two Years or More Retarded	9	3	39	11	24	0	72	14	86	83.7	43.6
Teacher Referral, Group Intelligence Test A, & Group Intelligence B	3	2	9	3	24	0	36	5	41	87.8	21.8
Teacher Referral, Group Intelligence Test A, & Group Achievement Test	11	6	28	7	24	0	63	13	76	82.9	38.2
Teacher Referral, Group Intelligence Test A, & Two Years or More Retarded	4	1	23	6	24	0	51	7	58	87.9	30.9
Teacher Referral, Group Intelligence Test B, & Group Achievement Test	10	7	11	3	24	0	45	10	55	81.8	27.3
Teacher Referral, Group Achievement Test, & Two Years or More Retarded	6	7	25	6	24	0	55	13	68	80.9	33.3
Group Intelligence Test A, Group Intelligence Test B, & Group Achievement Test	5	3	11	8	24	0	40	11	51	78.4	24.2
Group Intelligence Test A, Group Intelligence Test B, & Two Years or More Retarded	8	6	20	7	24	0	52	13	65	80.0	31.5
Group Intelligence Test B, Group Achievement Test, & Two Years or More Retarded	5	6	22	8	24	0	51	14	65	78.5	30.9
Group Intelligence Test B, Teacher Referral, & Two Years or More Retarded	3	1	6	2	24	0	33	3	36	91.7	20.0

identified by the Binet test is much lower, ranging from a high of 72 pupils or 43.6 per cent on the combination, Group Intelligence Test A, Group Achievement Test, and Two Years or More of Retardation, to a low of 33 or 20.0 per cent on the combination, Group Intelligence Test B, Teacher Referral, and Two Years or More of Retardation. For practical screening purposes it can be seen from table XVII that with any combination of three of the five referral factors applied, eight or nine of each ten pupils referred would score I.Q.'s of 75 or lower on the Binet test but only one-fourth to one-half of those so retarded would be referred, depending upon the combination used.

Results of the Application of Combinations of Four Referral Factors Compared with the Findings of the Prime Factor, the Stanford-Binet Test

The application of combinations of four referral factors was made similarly to that of combinations of three factors, each factor being used in combination with three other factors giving a total of five combinations of four factors each.

Of the total of 310 pupils referred and administered the Stanford-Binet Test, 91 were referred by combinations of four or more factors. Of these 91 pupils referred, 76 or 83.5 per cent scored I.Q.'s of 75 or lower on the Binet test. The percentage of accuracy of the application of combinations of four referral factors is appreciably higher than that of either two or three factors, but if only pupils who were referred by four factors were tested, 89 pupils or 53.9 per cent of those identified by the Binet test as scoring I.Q.'s of 75 or lower would escape further screening or identification. If referral is made only of those pupils appearing on four of the five factors used, from 87.5 per cent to 96.6 per cent of them would be expected to score I.Q.'s of 75 or lower on the Binet test, but only 15.8 per cent to 27.3 per cent of those would be identified or selected for further screening, depending upon the combinations used. (See Table XVIII, page 44.)

TABLE XVIII

NUMBER AND PERCENTAGE OF PUPILS REFERRED BY COMBINATIONS OF FOUR FACTORS COMPARED WITH THE FINDINGS OF THE STANFORD-BINET TEST

Referral Factors	Ident. by 4 Factors		Ident. by 5 Factors		Total Referred			Per Cent Col. (6) is of Col. (8)	Per Cent Col. (6) is of Total (165) IQ 75 and Lower
	SB IQ 75 or Lower	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ	Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Group Intelligence Test A, Group Intelligence Test B, Group Achievement Test, & Teacher Referral	7	2	24	0	31	2	33	93.9	18.8
Group Intelligence Test A, Group Intelligence Test B, Teacher Referral & Two Years or More Retarded	2	1	24	0	26	1	27	96.3	15.8
Group Intelligence Test A, Group Achievement Test, Teacher Referral, & Two Years or More Retarded	21	5	24	0	45	5	50	90.0	27.3
Group Intelligence Test A, Group Intelligence Test B, Group Achievement Test, & Two or More Years Retarded	18	6	24	0	42	6	48	87.5	25.5
Group Intelligence Test B, Group Achievement Test, Teacher Referral, & Two Years or More Retarded	4	1	24	0	28	1	29	96.6	17.0

Results of the Application of the Combination of all Five Referral Factors Compared with the Findings of the Prime Factor, the Stanford-Binet Test

Of the total of 310 pupils referred and administered the Stanford-Binet Test, 24 were referred by all five referral factors. Of these 24 pupils referred, 24 or 100 per cent scored I.Q.'s of 75 or lower on the Binet test. Although the application of all five referral factors is completely accurate, as in the application of combinations of four factors a relatively small number and percentage of those who should be included would be identified. It can be noted from Table XIX, below, that only 24 or 14.5 per cent of the total of 165 scoring I.Q.'s of 75 or lower on the Stanford-Binet Test were referred by all five factors.

TABLE XIX

NUMBER AND PERCENTAGE OF PUPILS REFERRED BY ALL FIVE FACTORS COMPARED WITH THE FINDINGS OF THE STANFORD-BINET TEST

Referral Factors (1)	Total Referred: SB IQ 75 or Lower (2)	Total Referred: Above 75 IQ (3)	Total Referred: Total (4)	Per Cent Col. (2) is of Col. (4) (5)	Per Cent Col. (2) is of Total (165) IQ 75 and Lower (6)
Group Intelligence Test A, Group Intelligence Test B, Group Achievement Test, Teacher Referral, & Two Years or More Retarded	24	0	24	100.0	14.5

Draw-A-Man Referrals Compared to Findings of the Prime Factor, the Stanford-Binet Test

In an attempt to find a simple and easily administered method of referring children for classes for the mentally retarded, the teachers in all six grades of the areas surveyed were asked to have each of their pupils make a drawing of a man. This was to be very similar to the Goodenough Draw-A-Man Test except that the drawings were to be evaluated by the teacher rather than technically scored. Each teacher was asked to select the obviously poor drawings, as far as detail was concerned, made by the pupils in her class. These pupils were to be considered as referrals to compare with the findings of the Stanford-Binet Test on the 310 children to whom the test was administered. Table XX, which follows below, reveals that of the 93 pupils referred by the drawings, 54 or 58.1 per cent scored 75 or lower on the Binet test. Also, only 32.7 per cent of the 165 identified by the Binet test were referred by the teachers from pupil drawings. This cannot be considered of great significance as there were in the whole area studied a total of seven grades or classes from which there was not even one referral made by the drawings. Conversely, many teachers marked practically all of the papers in their classes as being poor. It seems obvious that for some reason there was a breakdown in communication with the teachers or they did not consider this specific part of the project of sufficient worth to give it the attention and effort requested. In spite of the discrepancies associated with this part of the study it is believed there may be much potential in the study of drawings as an easily administered, inexpensive, and reliable means of referring children as prospects for classes for the mentally retarded.

TABLE XX
NUMBER OF PUPILS BY GRADE AND AREA IDENTIFIED
BY THE TEACHERS' EVALUATIONS OF DRAWINGS COMPARED
WITH FINDINGS ON THE STANFORD-BINET TEST

	GRADE												TOTAL		Per Cent Col. (15) is of Col. (14)
	1		2		3		4		5		6				
School Areas	Draw-A-Man	SB	Draw-A-Man	SB	Draw-A-Man	SB	Draw-A-Man	SB	Draw-A-Man	SB	Draw-A-Man	SB	Draw A-Man	SB	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
A	5	2	3	2	7	5	6	3	10	5	0	0	31	17	54.8
B	6	6	6	4	7	3	4	4	0	0	0	0	23	17	73.9
C	3	0	1	1	1	0	1	0	4	3	2	1	12	5	41.7
D	4	2	3	1	3	2	1	0	1	1	2	2	14	8	57.1
E	0	0	0	0	1	0	2	2	2	2	0	0	5	4	80.0
F	0	0	1	0	2	1	2	2	1	0	2	0	8	3	37.5
Total	18	10	14	8	21	11	16	11	18	11	6	3	93	54	58.1

This table should read as follows: Of the 5 children in Area A referred by the figure drawing, 2 scored I.Q.'s of 75 or lower on the Stanford-Binet Test (SB).

CHAPTER IV

BEHAVIOR CHARACTERISTICS ASSOCIATED WITH MENTALLY RETARDED AND PSEUDO-MENTALLY RETARDED CHILDREN

The following report of findings was obtained from a final clinical investigation of the behavior characteristics associated with mentally retarded and pseudo-mentally retarded children to determine, if possible, whether there were any marked differences in emotional imbalance, social maladjustment, physical disabilities, or in their physical development norms. The children referred to in this study as pseudo-mentally retarded are those pupils who were identified by two or more of the five preliminary screening factors used but were not classified by the Stanford-Binet Test as being mentally retarded. Of the 310 pupils referred by two or more of these factors, 165 (53.2 per cent) scored intelligence quotients of 75 or lower on the Stanford-Binet Test. The remaining 145 pupils, 94 boys and 51 girls, were, therefore, cast in the role of pseudo or falsely appearing mentally retarded pupils.

There is little doubt that isolated cases of genuine pseudo-mental-retardedness exist--that is children with functional forms of inadequacy who seem to be mentally retarded but actually are not.

This writer has no knowledge of an attempt to determine the exact number of pseudo-mentally retarded persons in any population sample in this country. In this study 46.8 per cent of the children in the final clinical screening were identified as scoring above 75 I.Q. when the Stanford-Binet Test was used.

A general description of the instruments employed to obtain the data was provided in Chapter II, and more detailed information concerning their use is given in the pages which follow.

Final Clinical Screening

In setting up the final clinical diagnostic screening this question was raised. Can a satisfactory differential diagnosis and prognosis be made in identifying mentally retarded and pseudo-mentally retarded children?

In order to test this hypothesis statistically it was decided to use various clinical diagnostic screening techniques which would further screen the 165 children previously identified by means of the Stanford-Binet Test as being mentally retarded, and the 145 children who had scored above 75 I.Q. on the same I.Q. test and who would be listed in this study as pseudo-mentally retarded pupils.

The four additional tests given each of the children in the final phase of the study were as follows:

Emotional Maladjustment

The Rosenzweig Picture Frustration Study was administered individually to each child in the final clinical diagnostic screening in an attempt to determine if there were any marked differences in the scores made by the children who had intelligence quotients of 75 or lower and those who had scored intelligence quotients above 75 on the Stanford-Binet Test.

The Rosenzweig picture association for assessing the reaction to frustration is a limited projective device. The procedure attempts to evaluate typical modes of response to everyday situations of stress by allowing the individual child to identify himself with and respond to anonymous figures in appropriate cartoon-like drawings.

In scoring, a Group Conformity Rating was assigned each child tested and was obtained by comparing the scores of the subject with expected scores for the 24 items in the test. When more than one criterion was given, any of the acceptable criteria or any acceptable combinations of them were acceptable in counting agreements. The total number of agreements were then added and the sum converted to a percentage on the basis of the total possible criteria items.

Social Maturity

The Doll's Vineland Social Maturity Scale provides a definite outline of detailed performances in respect to which children show a progressive capacity for looking after themselves and for participating in those activities which lead toward the ultimate independence as adults. The items in the scale are arranged in order of increasing average difficulty, and represent progressive maturation in self-help, self-direction, locomotion, occupation, communication, and social relations. This maturation in social independence may be taken as a measure of progressive development in social competence.

The underlying principles involved in the construction of this scale are much the same as those employed by Binet and Simon for their scale in measuring intelligence. Each item is conceived as representing a general growth in social responsibility which is expressed in some detailed performance as an overt expression of that responsibility.

The items on the scale were scored on the basis of information obtained from someone intimately familiar with the person scored, such as the mother, close relative, or guardian. Information was first sought regarding the child's chronological age, schooling, general ability, special handicaps, and other orienting data. Other information bearing on the general social status of the child was indicated by the father's usual occupation, general environment, and the like, so as to facilitate examining, to avoid embarrassment, and to allow for limiting circumstances in evaluating the information obtained.

The total score made by a child on the Doll test was converted into an age score. The age scores were converted into ratios or quotients. The next procedure used was to divide the pupil's age score by his chronological age and drop the decimal (SQ = SA ÷ CA). This was the same procedure used for converting Binet mental age scores to intelligence quotients. In this study the social quotients were used in comparison with the findings of the Stanford-Binet Intelligence Quotient scores. Limitations imposed by intelligence level, emotional attitudes, social conditioning, disposition, and the like, were presumed to be reflected in the scale itself and were not otherwise allowed for.

Physical Examinations

The clinical groupings in the study of physically handicapped children presented a problem. Within this large category were a number of separate and distinct groups of children, each of which was important in the diagnosing and screening of both mentally retarded and pseudo-mentally retarded children. Herein were children with impaired vision, children with impaired hearing, children with speech defects, and children with orthopedic and neurological impairments.

In order to lend assurance of proper diagnoses of physical and emotional ills of the children in the age groups used in the study, pediatricians were employed to do the examining. In the beginning, one pediatrician in active practice did the examining in one school area, but since he could devote but one day per week to the project it was decided to contact some of the leading schools of medicine in the South to secure residents in pediatrics who were completing their last few months of specialization to assist in examining the rest of the children in the study.

The chiefs of pediatrics in the various schools of medicine evidenced great interest in the study and six resident pediatricians, one from Duke University, one from Louisiana State University, two from the University of Tennessee, and two from Tulane University, were secured to examine most of the children in the study.

Each of the resident pediatricians spent an average of two weeks in the field with the Assistant Director of Research. In each of the school areas where the physical examinations were given, meetings were arranged whereby the local physicians were informed of the nature of the project and their full cooperation was secured. This cooperation was extremely important, for many parents contacted their own doctors about whether they should allow their children to be examined by the pediatricians.

In addition to the cooperation of local physicians in the project, the local county health department personnel, including the doctor and his nurses, willingly gave their assistance in examining the children, and also aided in assuring the parents of the need and nature of the examinations their children were receiving from specialists without cost to them. Local hospitals and doctors gave the use of their laboratory facilities without cost to the pediatricians.

A very complete physical examination was given each child by the pediatricians who used a form prepared by the Mississippi State Board of Health in the evaluation and scoring of each child involved in the final clinical section of the study. The doctors used a percentage cut-off for various disabilities for comparison purposes.

Physical Development History

The second step in evaluating the physical make-up of the children taking part in the final clinical screening was the securing of a physical development history from the mothers of the children who had been given physical examinations.

The Physical Development History Form, used by the pediatricians as a rating instrument in the interviews with the mothers, was devised by Dr. Margaret Batson, Assistant Professor of Pediatrics, University of

Mississippi School of Medicine.

The Physical Development History Form covered four areas, namely: (a) Familial - which dealt with the family history of emotional difficulties, neurological deficiencies, and convulsive disorders. Commitment to institutions for the feeble-minded of grandparents, parents, other close blood relatives, and siblings of the children in the study were secured and noted, as was treatment of parents and blood relatives in public and private mental hospitals (b) Brain damage - at birth or after birth (c) Evidence of prenatal infection of the mother by German measles or other virus which might have affected the child she was carrying (d) Infection of a child by such diseases as encephalitis, or meningitis.

As in the physical examination rating, the doctors in securing the physical development histories used a percentage cut-off for the disabilities for comparison purposes.

Statistical Treatment

The statistical findings of the differences of the frequencies obtained by each of the four factors used in the final clinical screening for the mentally retarded and the pseudo-mentally retarded were contrasted with the findings of the Stanford-Binet Test.

Simple and multiple correlations were used to determine the relationship of the dependent variable, the Stanford-Binet score, and the four independent variables consisting of the scores obtained from the Rosenzweig, Doll, Physical, and Physical Development History tests given to each of the children in the final clinical screening. In the computation of the regression coefficients, the associations of each of the other independent variables were taken into consideration. The coefficients, therefore, would indicate the net relationship between the dependent and independent variables, in this manner allowing for the other factors or variables which are also considered in the equation.

All the statistical computations were machine scored by IBM computers at Mississippi State University.

Test of Stability of the Five Final Clinical Screening Factors Measured by Their Respective Standard Deviations and Coefficients of Variation

The children in this section of the study were divided into two groups, one group being the pupils who had scored intelligence quotients of 75 or lower and the other group those children who had scored intelligence quotients above 75 on the Stanford-Binet Test. Each group was further divided into three sections, with two grades to a section in order to secure closer correlation of findings with children of the same age groups. Finally, all six grades were combined for comparison purposes with the findings of each of the three sections as noted above.

The stability of the scores for each of the five tests are measured by their respective standard deviation coefficients of variation. The standard deviation is an absolute measure of variability while the coefficient expresses the standard deviation as a per cent of the mean and it is a measure of the relative reliability. Therefore, the coefficient of variation reduces the variability of each set of scores to common terms so that they may be compared directly with each other.

The average scores and the variability of the average scores for each test for mentally retarded children are shown in Table XXI, page 54, and for the pseudo-mentally retarded children in Table XXII, on page 55.

TABLE XXI

STABILITY OF FIVE FINAL CLINICAL SCREENING FACTORS MEASURED BY THEIR RESPECTIVE STANDARD DEVIATIONS AND COEFFICIENTS OF VARIABILITY IN TESTING MENTALLY RETARDED CHILDREN

On Pupils Scoring Binet Intelligence Quotients of 75 or Lower

Grades	No. of Cases	Clinical Screening Factors	Average Scores or Mean	Standard Deviations	Coefficients of Variations of Average Scores
1-2					
	30	Stanford-Binet	68	6.10	8.97
	30	Rosenzweig	40	14.46	36.15
	24	Doll	85	11.85	13.95
	29	Physical	86	13.42	15.60
	24	Physical Development	89	7.36	8.27
3-4					
	63	Stanford-Binet	64	7.96	12.43
	63	Rosenzweig	46	12.60	27.39
	54	Doll	87	12.80	14.71
	63	Physical	86	13.73	15.97
	50	Physical Development	87	13.57	15.60
5-6					
	60	Stanford-Binet	65	8.13	12.51
	60	Rosenzweig	50	12.53	25.00
	52	Doll	85	12.46	14.66
	59	Physical	91	11.43	12.56
	52	Physical Development	87	13.10	15.06
All Grades 1-6					
	153	Stanford-Binet	65	7.79	11.98
	153	Rosenzweig	47	13.48	28.68
	130	Doll	85	12.56	14.78
	151	Physical	88	13.03	14.81
	126	Physical Development	87	12.39	14.28

Both Tables XXI and XXII reveal that the Stanford-Binet scores were the more stable of all the tests given. Scores for the Rosenzweig Picture Frustration Study for emotional stability showed the greatest amount of variability in each group tested. The Doll's Vineland Social Maturity Scale and the Physical Examination scores showed about the same degree of variability in most instances. Next to the Stanford-Binet scores the Physical Development History scores were the most stable as far as variability of test scores were concerned.

TABLE XXII

STABILITY OF FIVE FINAL CLINICAL SCREENING FACTORS MEASURED BY THEIR RESPECTIVE STANDARD DEVIATIONS AND COEFFICIENTS OF VARIABILITY IN TESTING PSEUDO-MENTALLY RETARDED CHILDREN

On Pupils Scoring Binet Intelligence Quotients Above 75

Grades	No. of Cases	Clinical Screening Factors	Average Scores or Mean	Standard Deviations	Coefficients of Variations of Average Scores
1-2	42	Stanford-Binet	88	8.27	9.40
	40	Rosenzweig	52	11.16	21.46
	29	Doll	94	12.82	13.64
	36	Physical	92	13.03	14.16
	25	Physical Development	89	12.75	14.33
3-4	65	Stanford-Binet	87	7.48	8.60
	65	Rosenzweig	54	11.56	21.41
	53	Doll	93	20.18	21.70
	62	Physical	93	9.47	10.18
	49	Physical Development	92	15.37	16.71
5-6	35	Stanford-Binet	85	7.01	8.25
	35	Rosenzweig	49	11.76	24.00
	26	Doll	94	14.20	15.10
	32	Physical	86	17.58	20.44
	25	Physical Development	95	7.06	7.43
All Grades 1-6	142	Stanford-Binet	87	7.67	8.82
	140	Rosenzweig	52	11.65	22.40
	108	Doll	94	16.96	18.04
	140	Physical	91	13.27	14.58
	99	Physical Development	92	13.22	14.37

Simple Correlation Analysis Findings of Final Clinical Screening Scores

In this statistical analysis, only those children who had taken all five of the final clinical screening tests were included in the analysis, thus reducing the number of cases to 220.

The correlation coefficients presented in this study measured the degree of association among the variables, and the square of the correlation coefficients measures the per cent of variation between the scores of one test with another test.

TABLE XXIII

SIMPLE CORRELATION BETWEEN THE ROSENZWEIG AND THE STANFORD-BINET TEST SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Stanford-Binet and Rosenzweig Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.075	19	.003	.6	a/
3-4	44	.076	44	.111	.6	1.2
5-6	17	.150	48	.238	2.2	5.7
All Grades	89	.340**	121	.202*	11.5	4.1

Note: a/ less than .05 per cent
*r significance at the .05 level of probability that one can be 95 per cent confident that a relationship does exist.
**r significance at the .01 level of probability that one can be 99 per cent confident that a relationship does exist.

Simple Correlation Between Rosenzweig and Stanford-Binet Scores

Table XXIII above reveals that the correlation between the Stanford-Binet and the Rosenzweig tests was very low for grades one through four in both the mentally retarded and pseudo-mentally retarded pupil groups. Scores from the Rosenzweig test explained less than 12 per cent of the variations in the Stanford-Binet Test in each set of data.

When the scores for all six grades were combined, however, and Fisher's statistical tables had been consulted, it was found that a correlation coefficient of .340 between the findings of the Rosenzweig and Stanford-Binet tests for mentally retarded children indicated a probability that in 99 cases out of 100 a relationship did exist between the two tests in screening mental deviates. In like manner, a correlation coefficient of

.202 for the same tests dealing with pseudo-mentally retarded children indicated a probability that in 95 cases out of 100 a relationship did exist between the two tests in locating children who might appear to be mentally retarded but were not.

TABLE XXIV

SIMPLE CORRELATION BETWEEN THE DOLL'S VINELAND SOCIAL MATURITY SCALE TEST SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Stanford-Binet and Doll Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.418	19	.423	17.5	17.9
3-4	44	.207	44	.370*	4.3	13.7
5-6	17	.294	48	.479**	8.6	22.9
All Grades	89	.238*	121	.483**	5.7	23.3

Note: *r significant at the .05 level - probability that one can be 95 per cent confident that a relationship does exist.
**r significant at the .01 level - probability that one can be 99 per cent confident that a relationship does exist.

Simple Correlation Between Doll and Stanford-Binet Scores

When Table XXIV above is consulted it may be noted that there is a low correlation between the Doll and Stanford-Binet test findings in the first two grades of the elementary schools for both the mentally retarded and pseudo-mentally retarded children. There was a low correlation between the two tests in grades three through six for the mentally retarded pupils, but a much higher correlation in those same grades for the pseudo-retarded children. When all grade scores were considered it was found that a correlation coefficient of .238 between the findings of Doll's Vineland Social

Maturity Scale and the Stanford-Binet Test indicated a probability that in 95 cases out of 100 a relationship did exist in the identification of mental deviates. Correlation coefficient scores in grades three through six indicated a probability of from 95 to 99 chances out of 100 that a relationship did exist in locating pseudo-mentally retarded pupils by means of the use of the Doll test of maturity.

TABLE XXV

SIMPLE CORRELATION BETWEEN THE PHYSICAL EXAMINATION SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Stanford-Binet and Physical Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.200	19	.206	4.0	4.2
3-4	44	.251	44	.482**	6.3	23.2
5-6	17	.471*	48	.074	22.3	.5
All Grades	89	.280**	121	.231**	7.8	5.3

Note: *r significant at the .05 level - probability of 95 chances out of 100 that a relationship does exist.
**r significant at the .01 level - probability of 99 chances out of 100 that a relationship does exist.

Simple Correlation Between Physical Examination and Stanford-Binet Scores

The correlations between physical fitness and the Stanford-Binet findings were very low for grades one, two, three and four for the mentally retarded children, as well as for grades one, two, five and six for the pseudo-mentally retarded pupils.

When the scores for all six grades were combined, however, it was found that a correlation coefficient of .280 for the mentally retarded children, and a correlation coefficient of .231 for the pseudo-mentally retarded children indicated a probability that in 99 cases in 100 a relationship did exist between the findings of physical fitness and the Stanford-Binet intelligence rating, Table XXV, page 58.

TABLE XXVI

SIMPLE CORRELATION BETWEEN THE PHYSICAL DEVELOPMENT HISTORY SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Stanford-Binet and Physical Development Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.262	19	.520*	6.9	27.0
3-4	44	.223	44	.365*	5.0	13.3
5-6	17	.210	48	.457**	4.4	20.9
All Grades	89	.235*	121	.325**	5.5	10.6

Note: *r significant at the .05 level - probability of 95 chances out of 100 that a relationship does exist.
**r significant at the .01 level - probability of 99 chances out of 100 that a relationship does exist.

Simple Correlation Between Physical Development History and Stanford-Binet Scores

Table XXVI above reveals a range in correlation between the Physical Development History and the Stanford-Binet scores for the mentally retarded from .210 to .262. The range in correlation for the same tests dealing with the pseudo-mentally retarded was from .325 to .520, the highest correlation that was found between the dependent variable, the Stanford-Binet Test and any of the four independent variables.

Simple Correlations Between the Rosenzweig Test and Each of the Other Three Independent Variables

The correlation coefficients between each of the four independent variables were also calculated and the results are shown in the tables which follow.

The correlations between the Rosenzweig test scores and the scores of the other three independent variables were so low in each instance that the findings would suggest independence as revealed in Tables XXVII, XXVIII, and XXIX.

TABLE XXVII

SIMPLE CORRELATION BETWEEN ROSENZWEIG SCORES AND DOLL SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variations in Rosenzweig and Doll Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.212	19	.038	4.5	.1
3-4	44	.013	44	.173	a/	3.0
5-6	17	.019	48	.095	a/	.9
All Grades	89	.119	121	.006	1.4	a/

Note: a/ less than .05 per cent

TABLE XXVIII

SIMPLE CORRELATION BETWEEN ROSENZWEIG SCORES AND PHYSICAL EXAMINATION SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Rosenzweig and Physical Test Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.138	19	.010	1.9	a/
3-4	44	.234*	44	.163	5.5	2.7
5-6	17	.220	48	.217	4.8	4.7
All Grades	89	.043	121	.041	.2	.2

Note: a/ less than .05 per cent
*r significant at the .05 level - probability of 95 chances out of 100 that a relationship does exist.

TABLE XXIX

SIMPLE CORRELATION BETWEEN ROSENZWEIG SCORES AND PHYSICAL DEVELOPMENT HISTORY SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Rosenzweig and Physical Development Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.162	19	.236	2.6	5.6
3-4	44	.028	44	.215	.1	4.6
5-6	17	.134	48	.164	1.8	2.7
All Grades	89	.070	121	.026	.5	.1

Simple Correlation Between the Doll Test and Each of the Other Two Independent Variables

The correlation between the Doll's Vineland Social Maturity Scale and the Physical Examination test was very low, ranging from .018 to .251 for the children averaging 75 I.Q. or lower on the Stanford-Binet Test. The correlation between the Doll and the Physical Examination scores was somewhat higher for the children who averaged above 75 I.Q. on the Stanford-Binet Test ranging from .064 for children in grades five and six to a high of .381 for pupils in grades three and four. Note Table XXX.

The correlation between the Doll and Physical Development History scores showed the highest degree of correlation with more consistency than any other pair of independent variables, as shown in Table XXXI, page 63.

TABLE XXX

SIMPLE CORRELATION BETWEEN DOLL SCORES AND PHYSICAL TEST SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Doll and Physical Test Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.029	19	.206	.1	4.2
3-4	44	.251	44	.381**	6.3	14.5
5-6	17	.018	48	.064	a/	.4
All Grades	89	.070	121	.260**	.5	6.8

Note: a/ less than .05 per cent
**r significant at the .01 level - probability of 99 cases out of 100 that a relationship does exist.

TABLE XXXI

SIMPLE CORRELATION BETWEEN DOLL AND PHYSICAL DEVELOPMENT HISTORY SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Doll and Physical Development Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.427	19	.344	18.2	11.8
3-4	44	.639**	44	.394**	40.8	15.5
5-6	17	.158	48	.230	2.5	5.3
All Grades	89	.561**	121	.314**	31.5	9.9

Note: **r significant at the .01 level - probability of 99 chances out of 100 that a relationship does exist.

Simple Correlation Between Physical Examination and Physical Development History Scores

Table XXXII, page 65, reveals that the correlation between the Physical Examination and the Physical Development History scores was very low in the case of the mentally retarded children, ranging from .131 to .306.

When the scores for all six grades were combined, it was found that correlation coefficient of .407 for the pseudo-mentally retarded children indicated a probability that in 99 cases in 100 that a relationship did exist between the findings of physical fitness and physical development histories of the pupils concerned.

Multiple Regression Analysis Involving the Dependent Factor, the Stanford-Binet Scores, and the Four Independent Factors, the Rosenzweig, Doll, Physical Examination, and Physical Development History Scores

As in the preceding section of Chapter IV, which dealt with simple correlations of the five factors used in an attempt to locate mentally retarded and pseudo-mentally retarded children, the multiple regression analysis was based on 22 cases and in each case the children had been given the Stanford-Binet Intelligence Test and four alternative tests.

It is frequently useful to estimate or predict the theoretical score of one variable, given his score in a related variable. For example, if it is known that scores on an intelligence test will later be correlated with emotional imbalance, social maturity, physical fitness, and physical development history test scores, those test scores might also be used in locating and screening mental deviates and pseudo-mentally retarded children.

The idea of prediction, in this sense, naturally follows regression. In the prediction situation, the dependent variable, the Stanford-Binet Test, is referred to as the criterion variable, and the four independent variables as the predictor variables.

Since the Stanford-Binet Test was used as the criterion factor, and each child had been given the alternative test, the analysis was extended to test the value of the scores for the four predictor alternatives in predicting the expected scores on the Stanford-Binet Test. The results of the analysis are shown in Table XXXIII, page 66.

As revealed in Table XXXIII, the effect of the Rosenzweig scores on the Stanford-Binet scores was negative for grades one through four for the mentally retarded children, and for grades one and two for the pseudo-mentally retarded pupils. There were positive effects for all other groups of children. However, the variability of the regressive coefficients among

TABLE XXXII

SIMPLE CORRELATION BETWEEN PHYSICAL EXAMINATION AND PHYSICAL DEVELOPMENT SCORES BY GRADES AND BY CHILDREN WHO SCORED 75 I.Q. OR LOWER AND THOSE SCORING ABOVE 75 I.Q. ON THE STANFORD-BINET TEST

		Correlation Coefficients Based on Stanford-Binet Scores		Correlation Coefficients Based on Stanford-Binet Scores	Percentage of Variation in Physical Examination and Physical Development Scores	
Grades	Degrees of Freedom	SB IQ 75 or Lower	Degrees of Freedom	Above 75 IQ	SB IQ 75 or Lower	Above 75 IQ
1-2	18	.306	19	.173	9.4	3.0
3-4	44	.187	44	.495**	3.5	24.5
5-6	17	.131	48	.439**	1.7	19.3
All Grades	89	.149	121	.407**	2.2	16.6

Note: **r significant at the .01 level - probability of 99 chances out of 100 that a relationship exists.

TABLE XXXIII

SUMMARY OF REGRESSION ANALYSIS WITH THE STANFORD-BINET SCORES BEING DEPENDENT ON THE ROSENZWEIG, DOLL, PHYSICAL EXAMINATION, AND PHYSICAL DEVELOPMENT HISTORY SCORES BY GRADES AND BY CHILDREN SCORING 75 I.Q. OR LOWER AND OTHERS ABOVE 75 I.Q.

				Effect of Stanford-Binet Score on a Unit of Change in				Percentage Variation Stanford-Binet Score Explained by 4 Independent Variables
Grades	No. of Cases	Degrees of Freedom	Constant Term	Rosenzweig	Doll	Physical Examination	Physical Development	Coefficient of Determination
IQ 75 or Lower								
Grades 1-2	23	18	44.329	-.083	.200	-.015	.105	21.5
3-4	49	44	63.273	-.015	.043	.165	.050	10.4
5-6	22	17	64.454	.013	-.158	.175	.211	35.3
All Grades	94	89	35.152	.266*	.075	.120*	.096	22.7
Above 75 IQ								
Grades 1-2	24	19	47.124	-.092	.171	.018	.307	35.2
3-4	49	44	18.718	.162	.137	.206	.095	33.8
5-6	53	48	25.500	.120*	.248	.121	.268	40.1
All Grades	126	121	8.815	.192*	.380*	.041	.160*	30.6
All Cases All Grades	220	215	17.626	.198*	.224*	.129*	.174*	22.6

Note: Value of *t significant at the .05 level - probability of 95 chances out of 100 that a relationship exists.

groups indicates that the Rosenzweig Picture Frustration Study, a test to determine emotional imbalance, was not an effective alternate for the Stanford-Binet Test in locating mentally retarded children. Although the correlation between the two tests was low, a "t" value did indicate significance at the .05 level with a probability of 95 chances out of 100 that a relationship did exist between the two tests--the Stanford-Binet and the Rosenzweig--when all six grades were combined. With children who scored above 75 I.Q. on the Stanford-Binet Test, a "t" value indicated significance at the .05 level with a probability of 95 chances out of 100 that a relationship did exist between the findings of the Stanford-Binet and the Rosenzweig tests in locating pseudo-mentally retarded children in grades five and six, and also when all six grades were combined.

The effect of the Physical Examination test scores on the Stanford-Binet Test scores revealed a negative value for grades one and two for children with I.Q. ratings of 75 or lower. All other regressions were positive. However, only four of the coefficients were significantly different from zero; therefore, the physical examination results must be considered a poor subsitute for the Stanford-Binet Test in locating mentally retarded and pseudo-mentally retarded children.

The Physical Development History test was the only test that showed a consistent positive effect on the Stanford-Binet scores. Although the coefficients for this test were consistent with respect to sign, only four out of the nine coefficients were significantly different from zero. Therefore, it too must be considered not as effective as the Stanford-Binet Test in screening both mentally retarded and pseudo-mentally retarded children.

The combined effect of all four independent test scores on the Stanford-Binet scores were measured by the coefficient of determination, which in turn is the square of the multiple correlation coefficient. The coefficient of determination measures the percentage variation in the Stanford-Binet scores explained by the scores of the other four alternative tests. The combined effect of the four tests explained only from 10 to 50 per cent of the variations in the Stanford-Binet Test scores. Therefore, the results from all four alternative tests must be considered as a poor substitute for the Stanford-Binet Test in screening both mental deviates and pseudo-mentally retarded children.

In the clinical screening program used in this chapter, four alternative tests were used in an attempt to determine their effectiveness in comparison to the findings of the Stanford-Binet Intelligence Test with the same children. However, the findings revealed a low correlation for each of the four alternative tests with the Stanford-Binet findings. Perhaps a statement by two leading writers in the fields of statistical methods and analysis may partially explain why it is difficult to measure intelligence by means of such alternative tests as were used in this section of the study.

> Perhaps one of the reasons why so little is reported about the validity of mental tests is that, save only where a similar test is used as the "criterion," the validity coefficients are normally low. Values from .2 to .4 are quite common, and values as high as, or higher than, .6 are a rare occurance. This is a discouraging experience for a test constructor ...but, there is no need to be so discouraged, actually, if we remember that the criterion values themselves are generally far from perfect, in reliability as well as in validity, and that a value of .5 is "high," as validity coefficients go. In many situations, too, tests with validity coefficients as low as .2 or .3 are useful, particularly when combined with other and independent measures.[10]

---

[10] Johnson, Palmer O. and Jackson, Robert W. B., Introduction to Statistical Methods. New York: Prentice-Hall, Inc., 1953, p. 316.

Incidence and Percentages of Physical Development Findings and Physical Disabilities of Mentally Retarded Children

All the children in the final screening had been given complete physical examinations by the pediatricians, and following the examinations, physical developmental histories were secured from the mothers of the children involved in this clinical phase of the study. Table XXXIV, page 70, reveals the incidence and percentages of physical developmental findings and physical disabilities of the mentally retarded children.

The importance of securing physical developmental histories is emphasized when it was found that 47 (30.9 per cent) of the 152 children who had been identified as being mental deviates and had their physical development histories taken were from families with definite histories of commitment of blood relatives to institutions for the feeble-minded.

Of the 47 children in all six school areas surveyed with records of mental deficiencies in the family, 17 children were diagnosed as having multiple physical disabilities--3 children having emotional disturbance, sight loss, and hearing loss--2 children having heart disease, emotional disturbance, and hearing loss--9 children having hearing and sight loss--2 children having hearing loss and speech defects--and 1 child having an emotional disturbance and a speech defect.

Fifteen (approximately 10 per cent) of the mentally retarded pupils in the six school areas were identified by the pediatricians as suffering from brain injury at birth. Sixteen (10.5 per cent) were listed by the pediatricians as being emotionally disturbed.

TABLE XXXIV

INCIDENCE AND PERCENTAGES OF PHYSICAL DEVELOPMENT FINDINGS AND PHYSICAL DISABILITIES OF MENTALLY RETARDED CHILDREN

Final Clinical Screening - Grades 1 - 6

School Areas	No. of Pupils Given Test	Familial	Birth Injury	Child Emotionally Disturbed	Disease	Hearing Loss	Sight Loss	Speech Defect
A	46	10	0	0	4	12	14	0
B	48	28	10	15	0	22	28	2
C	14	2	1	1	0	8	9	5
D	26	7	4	0	0	16	13	0
E	6	0	0	0	0	3	1	0
F	12	0	0	0	0	2	7	2
Total	152	47	15	16	4	63	72	9
Per Cent		30.9	9.9	10.5	2.6	41.4	47.4	5.9

Four (2.6 per cent) of the mentally retarded children were suffering from disease: 63 (41.4 per cent) had a hearing loss; 72 (47.4 per cent) had a sight loss of varying degrees; and 9 (5.9 per cent) had speech defects.

Scores on the physical development test and the physical examination were based on the per cent of normalcy of each child examined. The median score on the physical development test for the pupils scoring Binet Intelligence Quotients of 75 or lower was 90. The median score on those children for the physical examination was 95.

Incidence and Percentages of Physical Development Findings and Physical Disabilities of Pseudo-Mentally Retarded Children

The physical development and physical examination findings of the pseudo-mentally retarded children revealed important differences when contrasted with like type of test findings of mentally retarded children in the six school areas surveyed. Table XXXV shows the incidence and percentages of physical developmental findings and physical disabilities of the pseudo-mentally retarded children.

TABLE XXXV

INCIDENCE AND PERCENTAGES OF PHYSICAL DEVELOPMENT FINDINGS AND PHYSICAL DISABILITIES OF PSEUDO-MENTALLY RETARDED CHILDREN

Final Clinical Screening - Grades 1 - 6

School Areas	No. of Pupils Given Test	Familial	Birth Injury	Child Emotionally Disturbed	Disease	Hearing Loss	Sight Loss	Speech Loss
A	35	5	2	5	1	11	8	0
B	35	6	2	9	4	10	8	0
C	23	0	0	2	1	4	5	2
D	26	1	0	4	0	5	6	0
E	6	0	0	1	2	0	0	0
F	20	0	1	4	0	4	2	0
Total	144	12	5	25	8	36	29	2
Per Cent		8.3	3.5	17.4	5.6	25.0	20.1	1.4

The physical development histories of the pseudo-mentally retarded children revealed that there were only 12 (8.3 per cent) of the children identified with families with histories of commitment of blood relatives to institutions for the feeble-minded in contrast to 47 (30.9 per cent) of the mentally retarded group of children. In like manner, only 5 (3.5 per cent) of the pseudo-mentally retarded children were diagnosed as having a birth injury in contrast to 15 (9.9 per cent) of the children who rated intelligence quotients of 75 or lower on the Stanford-Binet Test. Significantly, there were 25 (17.4 per cent) of the pseudo-mentally retarded children who manifested symptoms of emotional disturbance in contrast to 16 (10.5 per cent) of the mentally retarded pupils.

As for physical disabilities, there was evidence of a slightly higher incidence of disease among the pseudo-mentally retarded children with 8 (5.6 per cent) of the pseudo-mentally retarded with illnesses in contrast to 4 (2.6 per cent) of the children who were listed as mentally retarded. Although the incidence of hearing loss for the pseudo-mentally retarded children was high with 36 (25 per cent) it was lower than the incidence of hearing loss for the mentally retarded with 63 (41.4 per cent) of these children having hearing losses. Two children, who had been retarded two years in the lower grades, were found to be completely deaf by the examining pediatricians. These children were suffering from a chronic outer ear inflamation which had closed the outer canal to the ear. Local service clubs provided bone-induction hearing aids for these children and they were then able to compete in the classroom with their fellow students. Both children had been found to be normal in intelligence when they were given the Stanford-Binet Test.

The incidence of sight loss was higher for the mentally retarded children when 72 (47.4 per cent) of the mentally retarded pupils were found to have a sight loss compared to 29 (20.1 per cent) of the pseudo-retarded children. Nine (5.9 per cent) of the mentally retarded children had speech defects contrasted to 2 (1.4 per cent) of the pseudo-mentally retarded children.

The higher incidence of physical disabilities, with the one exception of disease, among the mentally retarded may very possibly have been due to the greater number of familial and brain injury cases among the children who were mental deviates.

With scores on the physical development test based on the per cent of normalcy of each child, the mean score for the pupils rating Binet Intelligence

Quotients above 75 was 86 per cent. This is in contrast with the mean score of 92 for those scoring Binet Intelligence Quotients of 75 or lower. The mean score on the physical examination was 87 for the mentally retarded pupils and 89 for the pseudo-mentally retarded pupils.

Social quotient scores on the Vineland Social Maturity Scale ranged from a low of 48 to a high of 130. The mean of the scores for the mentally retarded pupils was 83 while the mean score for the pseudo-mentally retarded pupils was 96. The mean score of the total of both the retarded and the pseudo-retarded pupils was 89.

The highest possible score on the Group Conformity Rating (GCR) of the Rosenzweig Picture Frustration Study is 100. Norms for this test give a composite group mean score of 62.1 per cent. The mean score for the mentally retarded pupils was a percentage of 53.0 and the mean score for the pseudo-retarded was 61.6 per cent. The mean total score of both the retarded and the pseudo-retarded in this study was 56.8. Only five mentally retarded pupils scored higher than 70 per cent and twelve pseudo-retarded pupils scored higher than 70.

According to the Stanford-Binet tests, the mean intelligence quotient score of the mentally retarded pupils was 65. The mean score of the pseudo-retarded pupils was 86. The mean score of the total of both the mentally retarded and the pseudo-retarded was an intelligence quotient of 75.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study was designed to explore the problems of screening mentally retarded pupils in order to find or devise a simple and practical method by which teachers and administrators could identify children in need of special education. Replies to questionnaires sent to the departments of education of the states and territories of the United States revealed a multiplicity of criteria and procedures of screening. The method used was to examine the relationships between the results of the application of various and easily administered measures and the pupil's need for special education class placement as determined by the findings of the Revised Stanford-Binet Intelligence Test. Attention also was given to physical, emotional, and social characteristics of mentally retarded children.

The following procedures were employed to implement the method used in the study:

(1) The application of (a) teachers' referrals, (b) group intelligence tests, (c) group achievement tests, and (d) age-grade placements tentatively to identify pupils who might qualify for special education classes.

(2) The administration of the Stanford-Binet Intelligence Test to those pupils tentatively identified by two or more of the factors indicated in (1) above. The Stanford-Binet Test was used as the "prime factor" for classification of the mentally retarded pupils in this study.

(3) The examination of all pupils tentatively identified by two or more of the factors indicated in (1) above by tests of social maturity and emotional stability and physical examinations

including both physical fitness and physical development.

(4) The determination of the factor or combination of factors that appeared to be most valid in identifying mentally retarded children.

In this study the pupils who were identified by two or more of the factors listed in (1) above were selected for further examination. Of the 4,824 pupils (2,424 boys and 2,400 girls) enrolled in this study, 411 were identified by two or more of the five preliminary factors and selected for further testing and study. Of these 411 pupils, only 310 (201 boys and 109 girls) were available for additional tests and examinations. The remaining 101 were not reached for further study because of moving, withdrawal from school and other causes of absence.

The Revised Stanford-Binet Intelligence Test was selected as the prime factor in determining the effectiveness of each of the five factors used in the first screening procedures to locate mentally retarded children. It was found that 165 pupils (110 boys and 55 girls) scored intelligence quotients on the Stanford-Binet Test of 75 or lower. This is 3.42 per cent of the total number of pupils enrolled in the study.

In the application of the various factors, there was a relatively low percentage of pupils referred who scored intelligence quotients of 75 or lower on the Stanford-Binet Test, ranging from a low of 55.5 per cent for Group Intelligence Test B and one or more other factors to a high of 70 per cent for Group Intelligence Test A and one or more other factors.

Of the 165 pupils who scored intelligence quotients of 75 or lower on the Stanford-Binet Test

24 were referred by all five factors

52 were referred by only four factors

76 were referred by four or five factors

64 were referred by only three factors

140 were referred by three, four or five factors

25 were referred by only two factors

165 were referred by two, three, four or five factors.

Of the 145 pupils who scored intelligence quotients above 75 on the Stanford-Binet Test and who were therefore considered erroneously identified

none was referred by all five factors

15 were referred by four factors

42 were referred by only three factors

57 were referred by three or four factors

88 were referred by only two factors

145 were referred by two, three or four factors.

The 145 pupils (94 boys and 51 girls) making scores on the Stanford-Binet Test higher than intelligence quotients of 75 were for the purposes of this study classified as pseudo or falsely appearing mentally retarded children.

In addition to the Stanford-Binet Intelligence Test, four alternative tests were used in the clinical screening of these 310 pupils in an attempt to identify social, emotional, and physical characteristics of mentally retarded children. An attempt was also made to compare the characteristics of the mentally retarded pupils as identified by these tests with the same characteristics of those pupils classified as pseudo-mentally retarded. These alternative tests were: the Rosenzweig Picture Frustration Study, the Vineland Scale of Social Maturity, Physical Examinations using a form prepared by the Mississippi State Board of Health, and Physical Development Histories on forms devised by Dr. Margaret Batson, Assistant Professor of Pediatrics, University of Mississippi School of Medicine.

The findings of these tests indicated a low correlation for each of the four alternative tests with the Stanford-Binet Test. There were, however, some interesting facts revealed by the application of these tests. Some of these facts are discussed in the following paragraphs.

Without a control group with which to compare the findings of these tests, there can be no accurate identification of characteristics of mentally retarded children in this study. From results of the tests used it appears that mentally retarded children are appreciably inferior physically, socially, and emotionally to other children.

In comparing the scores made on the same tests by both the mentally retarded and the pseudo-retarded pupils, it was found that the pseudo-retarded scored a few points higher than the mentally retarded pupils. The lowest differential was in the physical examination scores in which the mean score of the pseudo-retarded pupils was only two points higher than that for the mentally retarded pupils. The greatest difference was in the scores on the Vineland Scale of Social Maturity in which the mean score of the pseudo-retarded pupils was 13 points higher than that for the mentally retarded pupils.

From the results of these four alternative tests it might be inferred that three of them have significance in identifying characteristics of mentally retarded children--the Physical Development History and tests of social and emotional maturity. The Physical Development History probably would have appreciable value in screening mentally retarded children, especially as to etiological factors, while tests of social and emotional maturity could be effectively used as diagnostic instruments for remedial or corrective work.

An attempt was made to compare the results of the application of figure drawings as appraised by the teachers with findings of the Revised Stanford-Binet Intelligence Test. Although the findings were inconclusive, there was enough relationship between the two tests to suggest that further study of this factor might be feasible.

From the results of this study the following implications might be made:

1. All pertinent information on each pupil ~~is~~ was important in considering him for placement in a special class. A minimum of the five factors used in this study or similar criteria ~~should~~ was be applied to all of the pupils in the school populations surveyed.
2. Pupils identified by all of the factors in (1) above may be regarded as eligible for admission to special classes until evidence to the contrary is secured.
3. Pupils identified by only four of the five factors may be regarded as having a 90 per cent chance of being mentally retarded.
4. Pupils identified by only two or three referral factors should be considered doubtful prospects for classes for the mentally retarded.
5. No pupil should be admitted to a class for the mentally retarded until he has been administered at least one good individual intelligence test.
6. Prospective pupils for a special class should have a physical development history based on an examination by a competent pediatrician.
7. Reports of physical examinations and tests of social maturity and emotional health can be very helpful in teaching and remedial work.

APPENDIX A

RESEARCH PROJECT NUMBER 139

CONTRACT NUMBER 6906, PUBLIC LAW 531

1. Title: Study of Screening Procedures for Special Education Services to Mentally Retarded Children.

2. The problem is:

To find and diagnose children who are in need of special education placement, to assure that only eligible children are placed in classes for retarded children and also to identify in each school studied all the children who should be taught in such classes. Upon the solution of this problem depend the scope and quality of programs for retarded children and to a great extent the validity of studies of incidence of mental retardation.

3. The major objectives are:

To explore the relationships between various easily administered procedures in screening and the child's need for educational placement. Criteria to be investigated are group achievement testing, group intelligence testing, teacher rating, principals' rating, social maturity scale, personality scale, social history, general medical examinations, psychiatric examination and individual psychometric evaluation including verbal and performance. The end objective is by evaluating these criteria to formulate a sound, effective and workable method of screening children for placement in special classes for the mentally retarded. Statistical analyses will be made to determine which combination of factors appears to be most predictive of the need for special class placement.

4. The plan:

a. The scope of the project is to be a pilot study of some 5,000 children, restricted to elementary school-age children of grades one through six. Related literature and research on this subject are practically nil.

b. The essential structure of this project involves the total school-age population, grades one through six, in the schools selected by geographical areas for the basic sample on the group intelligence tests and teacher and principal referrals. Based on this triple criterion the children having the lowest ratings, probably 5 per cent to 10 per cent, will be selected for further intensive study. The further study will include individual verbal and performance psychometric examinations, social case histories, general medical examinations, and other data where indicated. Specialized medical examinations will be given as needed.

c. Psychological and achievement ratings and teacher referrals will be made on special forms designed for this purpose. Group tests will then be given by a person qualified by experience and training to administer such tests. Those children having the lowest ratings on the group tests and teachers' and principals' evaluation as potential candidates for special classes will be administered individual verbal and performance psychometric examinations by a qualified psychologist with experience and training in the individual testing of children. Social case histories will be prepared by a qualified social worker and general and specialized medical examinations given by qualified and reputable physicians. Each of the above persons should be a member of or eligible for membership in his local and national professional organizations. These professional services will be purchased. All data will be collected for computation and statistical compilation.

APPENDIX A (CONT.)

d. Standard statistical and research procedures will be used.

e. Standard methods of data analysis will be used under the general direction of the statistical consultant.

f. This is to be a two-year study.

June 1 - August 31, 1957:	Study of practices in Mississippi and other states, formulation of policies, refining of plans, preparations.
Sept. 1 - Dec. 31, 1957:	Group tests will be administered and teachers' and administrators' evaluations secured.
Jan. 1 - Jan. 31, 1958:	Group tests will be scored, data assembled and pupils selected for further study.
Feb. 1 - May 31, 1958:	Individual psychometric evaluations, medical examinations, and social case histories will be secured.
June 1 - Dec. 31, 1958:	Statistical data will be analyzed and compiled and conclusions reached.
Jan. 1, 1959 - May 31, 1959:	Report will be formulated for publication. The final report on the completed project should be submitted to the Office of Education by June 1, 1959.

5. The project director is W. R. Burris, Supervisor of Special Education, State Department of Education, Jackson, Mississippi, whose qualifications are as follows:

a. B. A. and M. A. Degrees from the University of Mississippi.

b. Master's Thesis on Education of Prisoners, including psychological, achievement and vocational interest testing.

c. Fourteen years experience in public schools--classroom teaching and administration.

d. Two years as Educational Director of the Mississippi State Penitentiary.

e. Two years os Counselor with the Division of Vocational Rehabilitation, State Department of Education.

f. Six years as Coordinator of the Mississippi Cerebral Palsy Hospital-School, four years of which he also administered the Program of Exceptional Children in Mississippi from its beginning to the present time.

g. Active member of the Health and Education Committees of the Children's Code Commission which do much research and study on the problems of children. (Among the publications resulting from such studies are: Emotionally Disturbed and Mentally Retarded Children, 1954; Study on School Drop-outs, 1956; Mississippi Report on Services to Children and Youth, 1950-55; Children Rejected for Classes for Exceptional Children, 1956. Studies now in progress are, "Social and Emotional Impact of Mental Retardation on the Child, the Home, and the Community," and "The Holding Power of Public Schools.")

6. Test and survey forms are to be purchased, and the cost of mechanical scoring will be included in this project.

7. The proposal is to begin with a Pre-planning Committee composed of the following members.

Dr. John E. Phay
Research Specialist
University, Mississippi
(Consultant for the project)

Dr. S. A. Brasfield, Director
Division of Instruction
State Department of Education
Jackson, Mississippi

Mr. H. R. Sigler, Director
Testing and Special Education
Jackson City Schools
Jackson, Mississippi

Mr. W. R. Burris, Supervisor
Special Education
State Department of Education
Jackson, Mississippi

Dr. Floy Jack Moore, Head
Department of Psychiatry
University Medical School
Jackson, Mississippi

The purpose of this small committee is to give some thought to the specific plan and mechanics of the study. Out of this group should come a rather concise plan of procedure to be presented to the Research Committee which may include the members of this Pre-planning Committee. This small committee will be dissolved with the formation of the larger committee. The exact personnel of the Research Committee will be determined in part by the reactions of the members of the Pre-planning Committee but should include representatives of the various disciplines involved in the study.

Heads of the following departments and organizations have expressed a willingness and desire to cooperate in this study:

The University of Mississippi Medical School

State Department of Public Welfare

Special Education Department, Jackson Public Schools

The Child Guidance Program of the State Board of Health

Division of Occupational Information and Guidance
State Department of Education

Mississippi Southern College
Special Education Section

As listed elsewhere in this plan, Dr. John E. Phay, Research Specialist, University, Mississippi, will serve as Project Consultant.

APPENDIX B

MISSISSIPPI STATE DEPARTMENT OF EDUCATION
QUESTIONNAIRE

Which of the following factors do you use in your state to identify mentally retarded children for placement in special classes designed for them?

Check once those factors you use, and double check those factors you feel are the ones you emphasize in making your placement of the children.

- ☐ 1. Teacher Referral
- ☐ 2. I. Q. or Mental Maturity
- ☐ 3. A. Q. or Achievement Quotient
- ☐ 4. Academic Record
- ☐ 5. Age-Grade Tables
- ☐ 6. Attendance
- ☐ 7. Social History
- ☐ 8. Family History
- ☐ 9. Physical Examination Reports
- ☐ 10. Physical Development History

Note: Add any others you might use which are not listed above.

APPENDIX C

SCHOOLS INCLUDED IN STUDY

Claiborne County

- Pattison Attendance Center
- Port Gibson Attendance Center

Humphreys County

- Belzoni Attendance Center
- Isola Attendance Center
- Louise Attendance Center
- Silver City Attendance Center

Jasper County

- East Jasper Consolidated School District
  - Heidelberg Attendance Center
  - Rose Hill Attendance Center
- West Jasper Consolidated School District
  - Bay Springs Attendance Center
  - Louin Attendance Center
  - Stringer Attendance Center

Madison County

- Canton Municipal Separate School District
- Farmhaven Attendance Center
- Flora Attendance Center
- Madison-Ridgeland Attendance Center

Marshall County

- Holly Springs Municipal Separate School District
- Byhalia Attendance Center
- Laws Hill Attendance Center
- Mt. Pleasant Attendance Center

APPENDIX C (CONT.)

Marshall County (Cont.)

Potts Camp Attendance Center

Slayden Attendance Center

Ocean Springs Municipal Separate School District (in Jackson County)

APPENDIX D

GUIDE SHEET
FOR
IDENTIFYING THE EDUCABLE MENTALLY HANDICAPPED

CRITERIA FOR REFERRING

1. The child must be educationally retarded; or, if he is less than eight years of age, he must be too immature for entering the first grade. Standardized achievement tests will usually reveal the child who is seriously retarded from an educational standpoint. He is unable to remain in his seat, disturbs everybody, and in general makes a complete nuisance of himself. His attention span is too short to permit him to participate in the group activities of the classroom. He must be handled on an individual basis.

2. The child must be unable to do reasonably good academic work even when he is given special individual attention by his teacher. Some very insecure children are unable to make progress in a class of thirty or forty children, but when the teacher works with them on an individual basis they make as much academic progress as one would expect of children of normal mental ability.

3. When alternatives and techniques available have been used and the child has not responded, the teacher can justify referring him for possible special education instruction. Some children of normal intelligence are unable to learn by the usual techniques and therefore need to be taught by some techniques which are adapted to their particular needs.

4. The child whom the teacher describes as, "He is bright enough but just can't learn," is not a mentally handicapped child.

5. The behavior problem child may be, but is not necessarily, a mentally handicapped child.

6. The economic and cultural status of the family of the mentally handicapped may be among the highest as well as among the lowest in the community.

7. From a clinical standpoint, the mentally handicapped child may be described as follows: emotionally dull, narrow interest range, stereotyped ideas, poor judgment and regard for reality, socially immature, difficulty in following directions, and little or no creative ability.

8. The child's I. Q. must be below the normal range, (if known). The normal range varies with the type of test which is used, but one will be safe in using an I. Q. of 80 as the maximum for a mental defective.

APPENDIX E

PUPIL EVALUATION

REFERRAL FORM

County____________________

Grade or grades______________

Date______________________

School or attendance center

____

Position or title if other than teacher__________________

Please list names of all the children in your room. From the criteria on the accompanying Guide Sheet, please indicate by a check mark in the proper column opposite each pupil's name whether you consider him an exceptional child or a normal child for educational purposes. This is to be absolutely confidential and your opinion will not be divulged to anyone outside of the research office.

Names of pupils	Should be taught in a special class	Should be taught in a regular class	Needs remedial work only	Not educable - Should not be in any class in public school	Remarks

APPENDIX F

TESTS USED IN STUDY

Kuhlmann-Anderson Intelligence Tests: 6th Edition

Otis Quick-Scoring Mental Ability Tests: New Edition

California Achievement Tests

Revised Stanford-Binet Intelligence Test, Form L

Rosenzweig Picture Frustration Study

Vineland Scale of Social Maturity

Physical Examination (Form used was prepared by the Mississippi State Board of Health.)

Physical Development History (Form used was devised by Dr. Margaret Batson, Assistant Professor of Pediatrics, University of Mississippi School of Medicine.)

APPENDIX G

MISSISSIPPI STATE DEPARTMENT OF EDUCATION
(Federal Project #139)

Physical Examination Report

School System__________________ County_______________ Date_______ 195__

Child's Name__________________ Parent's Name________________________

Height___________ Weight____________ Age_____________ Grade__________

I. General Appearance

II. Physical Examination

Skin
Lymph Nodes
Head
Skull
Hair
Eyes
Ears
Nose
Mouth
Teeth

Pharynx
Neck
Glands
Chest
Lungs
Heart
Abdomen
Genitalia
Extremities
Spine

Neurological

Knee jerk
Ankle jerk
Biceps
General Mobility
Balance

Posture while walking
Abdominal
Cremasteric
Babinski

APPENDIX G (CONT.)

III. Laboratory Reports

IV. Child's Reaction to Examination

V. Summary and Recommendations

VI. Percentage Rating of Physical Disability based on AMA check list

Signature____________________________, **M.D.**

APPENDIX H

MISSISSIPPI STATE DEPARTMENT OF EDUCATION
(Federal Project #139)

Physical Development History

(Prepared by Dr. Margaret Batson - University of Mississippi Medical School)

School System________________ County________________ Date________ 195__

Child's Name________________________ Parent's Name____________________

Height______________ Weight____________ Age____________ Grade________

I. Family History

Family history of emotional difficulties, neurological diseases, mental deficiencies, convulsive disorders.

II. Child's Past History

A. Birth

1. Weight and term of pregnancy

   Weight________________ Term______________

2. Complications during pregnancy. (Ask and record answers to following questions - if positive answers, state at what stage of pregnancy).

   a. Bleeding

   b. Infection (German measles, etc.)

   c. Trauma

   d. Toxemia

3. Type of delivery:

   a. Presentation-spontaneous______ instrumental________

   b. Anesthesia________________

   c. Duration of labor____________________

APPENDIX H (CONT.)

A. Birth (Cont.)

4. Breathing
    - a. Spontaneous________________
    - b. Artificial (resuscitation)__________
    - c. Breathing time____________
5. Condition during neonatal period
    - a. Convulsions_________
    - b. Apathy_________
    - c. Cyanosis_________
    - d. Pallor_________
    - e. Jaundice__________
    - f. Hemmorage__________
    - g. Skin eruptions_________
    - h. Injuries__________
    - i. Deformities__________
    - j. Vomiting__________
    - k. Excess crying__________
    - l. Refusal to nurse__________

B. Development (Record age in months)

(Mitchell-Nelson norms)

1. When head was raised voluntarily (one month)____________________
2. When infant sat up without support (6-7 months)________________
3. When first tooth erupted (6-8 months)________________
4. When infant first talked____________ what words________________
   vocabulary (12-18 months)__________________________________
5. When infant first walked alone (9-14 months)____________________
6. When and how bowel and bladder control was attained (2 years)
   ____
7. Age of admission to school____________________
    - a. Progress: success_______________
      failure_______________
    - b. Reaction to school______________________________
    - c. How well is he doing now______________________________

APPENDIX H (CONT.)

III. Child's Personal History

1. Eating habits: (past difficulties as well as present behavior)

2. Sleep disturbances: (nightmares, restless, etc.)

3. Fears: (at night, of people, animals, etc.)

Pediatrician to give numerical rating as to normal 100% or percentage of deviation of the normal.

Percentage rating

Signature______________________________, M.D.

BIBLIOGRAPHY

Baker, Harry J., Introduction to Exceptional Children. New York: The Macmillan Company, 1953.

Cruickshank, William M., and Johnson, G. Orville, Education of Exceptional Children and Youth. Englewood Cliffs: Prentice-Hall, Inc., 1958.

Garrison, Karl C., The Psychology of Exceptional Children. New York: The Ronald Press Company, 1950.

Hutt, Max L., and Gibby, Robert Gwyn, The Mentally Retarded Child. Boston: Allyn and Bacon, Inc., 1958.

Ingram, Christine P., Education of the Slow-Learning Child. New York: The Ronald Press Company, 1953.

Johnson, Palmer O., and Jackson, Robert W. B., Introduction to Statistical Methods. New York: Prentice-Hall, Inc., 1953.

Kirk, Samuel A., and Johnson, G. Orville, Educating the Retarded Child. Cambridge: Houghton Mifflin Company, 1951.

Letter from Dr. William M. Shanner, Director, Professional Services, California Test Bureau, Los Angeles 28, California, December 31, 1958.

McLemore, R. A., and McLemore, Nannie Pitts, The Mississippi Story. River Forest: Laidlaw Brothers, 1959.

Mississippi Children's Code Commission, Study on Rejectees of Classes for Mentally Retarded Children. Jackson: 1956.

Mississippi Code of 1942, Recompiled, Chapter 283, Laws of 1952.

Mississippi Code 1942, Annotated, 1958 Cumulative Supplement.

Mississippi State Department of Education, Statistical Data 1958-59. Jackson: 1959.

Pollock, Morris P., and Pollock, Miriam, New Hope for the Retarded. Boston: Porter Sargent, Publisher, 1953.

Sarason, Seymour B., Psychological Problems in Mental Deficiency. New York: Harper & Brothers, Publishers, 1953.

Segel, David, The Fourth Mental Measurements Yearbook, Oscar K. Buros, Editor. Highland Park: The Gryphon Press, 1953.

Wallin, J. E. Wallace, Education of Mentally Handicapped Children. New York: Harper & Brothers Publishers, 1955.